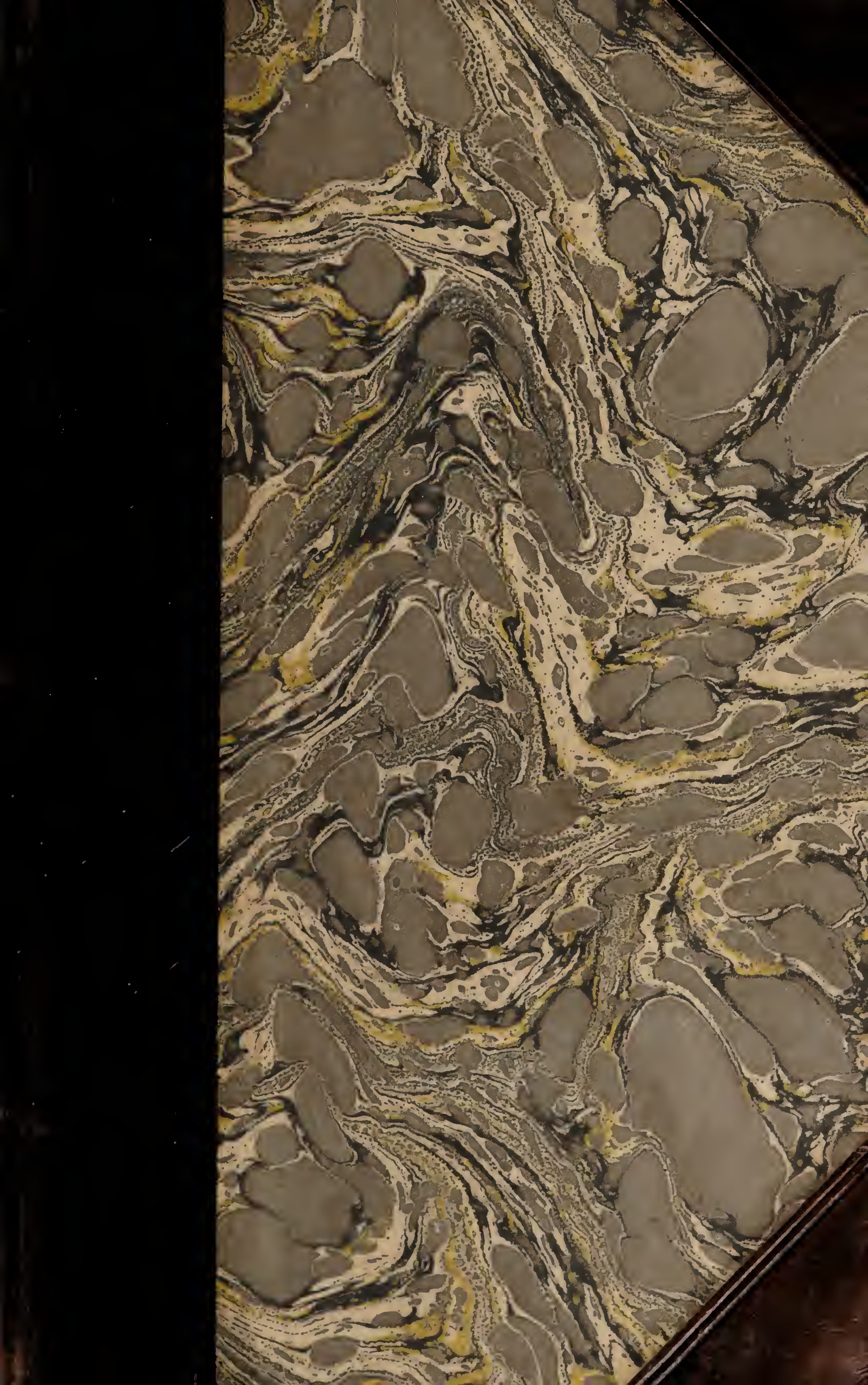

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THE
Mechanical Practice
OF
PHYSICK:

IN WHICH

The Specifick Method

IS

EXAMIN'D *and* EXPLODED;

AND THE

Bellinian Hypotheſis of *Animal Secretion* and *Muſcular Motion*, Conſider'd and Refuted.

WITH SOME

Occaſional REMARKS and SCHOLIA on Dr. LOBB's Treatiſe of the *Small Pox*, Dr. ROBINSON on the *Animal Oeconomy*, and Profeſſor BOERHAAVE's Account of the *Animal Spirits* and *Muſcular Motion*.

By T. MORGAN, *M. D.*

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between the two *Temple-Gates*, *Fleetſtreet*.
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1735

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TO

Richard Mead, M.D.

Fellow of the College of Physicians, and of the Royal Society;

AND

Phyſician to His Majesty.

Sir,

IT is the common Method of Authors, to inſcribe their Works to ſome great Names and Authorities, from whom they expect Protection againſt what they

they call the Ignorance or Malevolence of the World; but for my own Part, I have not ſo ill an Opinion of Mankind, as to think them incapable of judging for themſelves, in all Matters which nearly concern their Intereſt.

'TIS certain, indeed, that in Matters which are above their Sphere and Capacity of judging and acting, they ought to uſe the moſt rational Means of right Information, by adviſing with thoſe whom they think moſt capable of directing them, and moſt diſintereſted in the Affair.

I AM ſenſible that this Work of mine muſt undergo various Teſts and Trials, and be either approv'd or cenſur'd, according to Men's different Underſtandings, Inclinations, and Intereſts.

I HERE therefore appeal to You, Sir, as an unexceptionable Umpire, and as the ableſt and moſt impartial Judge of ſuch a Performance, of any Man that I could think of, or had the leaſt Acquaintance with.

YOUR Approbation, I know, would ſilence a thouſand impertinent Cavils; and yet I am convinced at the ſame time, that no Man, how great or popular ſoever, can patronize or recommend a weak Production, ſo as to give it any conſiderable Credit or Character with the Publick.

ALL therefore that I mean or aim at is, that ſo far as the beſt Judgment and Authority can go, which is certainly a great way, I am content to leave this Treatiſe of Phyſick either to ſtand or fall upon your Opinion of it.

THAT you may long live to exemplify the moſt amiable and commanding Character, which you have hitherto ſuſtain'd, as the Honour of your Profeſſion, the Encourager of Art and Induſtry, and a Friend to Mankind, is the ſincere and hearty Wiſh and Deſire of,

SIR,

Your moſt Obedient

Humble Servant,

T. MORGAN.

THE PREFACE.

THE Obſcurity and Uncertainty every where to be met with in the Practice of Phyſick, has been for a long Time the Matter of common Obſervation and Complaint: Nay, ſome Deiſts and Atheiſts have gone ſo far, as to pronounce the Faculty itſelf a publick Nuiſance, and to be of no more Uſe than the Clergy.

PEOPLE, they ſay, in the remoteſt Parts of the Kingdom, or in

Country-Villages, where they cannot have the Help of Phyſicians, *have yet better Health, and die leſs in Proportion than in* London, *or other Places that are beſt ſtock'd with them; and from hence they conclude, that there can be at leaſt no Neceſſity of theſe* artificial Healers. *And theſe Deſpiſers of the Faculty, endeavour farther to ſtrengthen and confirm their Error and pernicious Doctrine, by ſetting the moſt practical and experienced Phyſicians at Variance among themſelves.*

THEY pretend, that nothing can be right by one Man's Experience, but what another, upon the ſame Principle, ſhall pronounce wrong. And from hence they think it is certain and evident in Fact, that the Practice of Phyſick depends upon no conſiſtent Principles; that it cannot be reſolv'd into any general Rules or Methods of Procedure, and conſequently

quently is nothing elſe but a mere Piece of Art and Colluſion to get Money.

NOW the Deſign of the following Tract is to take off, as much as poſſible, this Imputation, and to ſhew, that Phyſick is as conſiſtent and rational a Profeſſion and Practice as any other.

THERE can be no doubt, indeed, but Men of the ſame Profeſſion muſt often ſtand in Competition. And in this Caſe Merit and Intereſt being two things, Artifice and Tricking will be often call'd in to aid, where honeſter Means fail. But this is the common Vice of Mankind, and cannot be ſpecially charged to the Account of Phyſicians. The impartial Juſtice, Honour, and Integrity, which many of the Faculty have always exemplify'd, and ſtill ſuſtain; and their allow'd Abilities in their particular Profeſſion,

ſion, and the general Circle of Knowledge, are, as I think, ſufficient to daſh and ſilence all the Pleas and Pretences of Ignorance and Malice on that Score: And yet it cannot be doubted or deny'd, but learned Men have very much differed in their Diſſertations and Diſcourſes upon the animal Oeconomy, and the Nature and Cure of Diſeaſes; and that Obſervation and Experience have been ſtill pleaded on all Hands, and urged to ſupport the moſt different and irreconcileable Hypotheſes. But yet this cannot prove that Phyſick depends upon no true conſiſtent Principles, or that the Profeſſion is chargeable with Falſhood, Contradiction, and Inconſiſtency, any more than any other Profeſſion and Practice. However, this is certain, that where there are no true conſiſtent Principles, there can be no rational conſiſtent Practice. All Practice muſt be founded upon ſome Principles or other, right or wrong; and there-

therefore, I preſume, no Phyſician, eſpecially no young Phyſician, will pretend to ſet up in Practice, without ſome general Rules and Principles of proceeding.

IF a Man will here ſay, that his Principles are experimental and practical, this is very well; but then theſe Principles could not be his own at firſt, and perhaps, never may be ſo; nay, 'tis impoſſible they ever ſhould be any Principles or Rules of Procedure at all, if he founds them upon the infinitely different and contradictory Opinions of experimental practical Writers. And an experienced old Woman or Nurſe might, in this Caſe, be as good a Phyſician, as any regular Collegiate in the World; for 'tis not a Diploma, or an Inveſtiture in Form, that can make the Difference.

BUT the Truth is, that moſt modern Phyſicians begin their Practice *upon no rational conſiſtent Principles at all, which Defect in the Schools ſome of them afterwards rectify from their own Reaſonings and Experience, and others not; but go on in the eternal Round of ſpecifick Remedies, trying one after another, through twenty different Diſpenſatories, and then at laſt pronounce the Diſeaſe incurable, becauſe they could not ſucceed in this Way. The chief Reaſon of this I take to be their ſpending too much Time and Pains in the Schools upon the various and contradictory Hypotheſes of the Moderns, and the infinite inconſiſtent Jumble of Recipe's and Preſcription, in what we call practical Writers, which a Man may read, ſtudy, and practiſe upon forty Years, and then ſit down at laſt juſt as wiſe as he was before. But how much better would it be to employ the ſame Time and Pains in ſtudying the Antients, and conſidering their more plain and natural Account of Diſeaſes! In which* *if they were ignorant of ſome things in Anatomy, which we better underſtand, yet they follow'd Nature with more Care and Exactneſs. And I know of no great modern Improvement in the Art of Healing, excepting only the preſent Method of Bliſtering, which was happily brought in by the phyſical Bully of this Age, and was not ſurely owing to any of the modern Hypotheſes.*

THE great modern Corrupter both of the Theory and Practice of Phyſick, was certainly Bellini; *who ſeems not to have underſtood any one Principle of animal Motion, but conſtantly aſcribes to one Law of Nature what really belongs to another. However, I am not to enter farther into this Debate here. I think I have ſaid enough in ſeveral of the following Propoſitions to prove it, or have at leaſt given his Diſciples and Followers a ſufficient Opportunity to defend* *their Maſter, ſo far as I am miſtaken, and they are able to confute me.*

BUT before Bellini, *the empyrical enthuſiaſtick Chymiſts, ſuch as* Paracelſus, Van Helmont, *and others, had introduced into Phyſick, the Principles of the ſpecifick and corpuſcularian Philoſophy, and carried the Art of Healing beyond all human Judgment and Comprehenſion; which* Bellini's *pretended mechanical Scheme did not at all mend, but rather made it worſe than before.*

AMONG ourſelves, Dr. Willis *muſt be allow'd as a perfect Maſter of the corpuſcularian Philoſophy as apply'd to Phyſick. He underſtood perfectly well the Exploſions and Suffocations of the* animal Spirits, *and the chymical Effects, Changes, and Tranſmutations produced in the animal Body, by the various Mixtures, and mutual Actions and Reactions of Salts*

Salts and Sulphurs in the Blood; and though many have endeavour'd to imitate, yet none could ever equal him in this way.

THIS enthuſiaſtick Cant Philoſophy has furniſh'd abundance of Gentlemen in the Profeſſion of Phyſick, with Matter enough for Oſtentation, and an inexhauſtible Fund of Abſurdity and Nonſenſe, which is much admired by thoſe who cannot judge of it. But, perhaps, it might be very well if the Parliament would take this Matter into Conſideration, ſo far as to oblige all Phyſicians to talk Engliſh *to their Patients, and not to amuſe them with technical Words and Terms of Art, out of the* Greek *and* Latin *Languages, which they cannot underſtand, and which perhaps are ſeldom underſtood by thoſe that uſe them.*

IN the following Propoſitions, I have endeavoured to throw off this incomprehenſible Jargon, and to reduce the Practice of Phyſick to the known Laws of Motion and Mechaniſm. How far I have ſucceeded in it, muſt be left to the Judgment of the Publick, to whoſe Approbation or Cenſure I am willing to ſubmit; and if I may be thought to have treated ſome Gentlemen with too little Ceremony, who had deeply engaged themſelves in this immechanical and falſe Philoſophy, they will be at Liberty, however, to make Repriſals upon me in the ſame way, or in any other way which they may think more convenient.

Sadler's-Hall,
March 5, 1734-5.

T. Morgan.

THE Mechanical Practice OF PHYSICK.

HAving obſerv'd and conſider'd for many Years paſt the modern State of Phyſick, and the Hypotheſes which generally prevail among thoſe who vouchſafe to reaſon about it at all; and finding that we are generally fallen into the notion of occult Qualities and ſpecifick Remedies; I thought it might be of ſome Conſequence to write a practical Book, in order, if poſſible, to reſtore the old ſimple Method of imitating Nature; by which perhaps we might come to the true Knowledge and Cure of Diſeaſes, without being ſuch deep Philoſophers as to know their real Eſſences and intrinſick corpuſcularian Cauſes.

I have always thought that the internal real Conſtitution of the Diſeaſe, or, which is the ſame thing, the real original Diſeaſe itſelf, is the true Cauſe of all its external Appearances or Symptoms, and the utmoſt Bounds to which our Philoſophy and Reaſonings in Phyſick can reach; and I have always obſerv'd, that whenever the Principles of the corpuſcularian ſpecifick Philoſophy have been aſſumed and apply'd, as it has been a ſure Mark of Ignorance or Indolence, ſo it has only ſerv'd to perplex the whole Matter, and miſguide the Phyſician.

How Medicines act, and what Effects may naturally and mechanically be expected from them, is a Queſtion of the laſt Importance in Phyſick; but a Queſtion, of which the Gentlemen in the Specifick Way can never give any rational Solution; and whenever they attempt to reaſon in this way, they are plainly out of their Element, and cannot help diſcovering a Weakneſs which they labour to conceal.

THE Caſe in ſhort ſtands thus; the Specifick Practice always ſuppoſes certain occult Qualities in Medicines, by which they work their Effects in a ſecret, inexplicable way, no body knows how, and cure Diſeaſes, without any regard to the known eſtabliſh'd Laws of Matter and Motion; or, which is the ſame thing, without viſibly or ſenſibly affecting any of the natural Evacuations and Secretions.

THE whole Buſineſs in this way is to find out a Specifick Remedy, and to aſcertain the Uſe of it; which being accompliſh'd, the thing is done, and every Nurſe or old Woman may afterwards apply it as well as the beſt Phyſician.

THIS Whimſy has employ'd the Thoughts and Labours of both the learned and unlearned World for at leaſt two thouſand Years paſt; the whole mineral, vegetable and animal Kingdoms have been ſearch'd, ranſack'd, and tortured for Specificks; not a Bone of the human Skull, or an Elk's Hoof have been left untry'd; the very Hair of the Head, the Nails of the Toes and Fingers, and every Excrement that can be thought on, have been moſt judiciouſly and in-

induſtriouſly apply'd; and the Fire in its utmoſt Force has been ſet to work upon all Sorts of Subſtances, of what Nature or Kind ſoever. But ſtill the learned Specificians are exactly where they were, and their Diſciples come out of the Schools juſt as wiſe as when they went in; and this, after many thouſand Volumes have been written upon the Experience of all paſt Ages, and as many Diſpenſatories compoſed as there are Diſeaſes in a Human Body; and for the modern Advance and Improvement of this Specifick Method, not to mention Foreigners, we are infinitely indebted to ſeveral great Men of our own Nation; ſuch as our *Culpepers*, our *Salmons*, our *Quincys*, *Allens*, and *Shaws*; who, to their Immortal Honour, have employ'd their vaſt Abilities, and uſed their beſt Endeavours, to make every Fool a Phyſician, and every Phyſician a Fool.

ANY of theſe Gentlemen will readily give a hundred infallible Recipe's for every Diſeaſe incident to the Human Body; of which, after all their Boaſts, not one of them can reach the Caſe, tho' they are all ſign'd and ſeal'd with a *Probatum* from Experience. I know not indeed how far theſe *Adepti* may deſerve the Thanks of their Country, for furniſhing every *Engliſh* Family with Books to quack upon, and enabling

bling them to direct the Apothecary after what manner he is to deſtroy their Health; but 'tis certainly a moſt ridiculous Thing, to put ſuch an infinite Number of infallible Preſcriptions into the hands of the common People, with this Caution at the ſame time, that they are never to make uſe of them without farther Advice: For ſhould this be the Caſe, no Reaſons can be aſſign'd for any ſuch Publications at all, but only for the ſake of the Author and Bookſeller, who in this way, it ſeems, are honeſtly to get a Penny by cheating the World about them. In this ſpecifick Method, 'tis hard to find an old Woman who is not an approv'd Phyſician, or a young Woman who does not know how to cure her Husband; but the greateſt Miſchief of all is, when the ſpecifick Phyſician and Apothecary lay their Heads together, to contrive what ought to be done for their mutual Intereſts; for in this Caſe a formidable Heap of loathſome Medicines, ranged under diſtinct Claſſes, in Papers, Boxes, Bottles and Gally-pots, are to be forced upon the Stomach at ſmall Intervals, and *reluctantè naturà*, which often makes the Doctor more dreaded than the Fees, and the Medicines more intolerable than the Diſeaſe.

I am ſenſible, that whoever will attempt to encounter vulgar Errors, muſt expect to be run down, ſo far as poſſible, by a popular Noiſe and Clamour, raiſed upon the Authority of the reputedly Learned; who, having firſt of all impoſed upon themſelves, carry the Cheat farther, and ſtrongly impreſs the common People with it; but notwithſtanding this, I ſhall venture abroad the following Propoſitions, upon the ſole Foundation of Reaſon and Facts.

PROP. I. Lemma.

No Sort of Subſtances can paſs the Lacteals, recipient Lymphaticks, or concoctive Strainers, but in the Form of a Fluid, previouſly reduced to an exceeding fine and imperceptible Vapour.

IT is certain in Fact from Microſcopick Obſervations, that the Diameter of the largeſt Blood Globules do not exceed $\frac{1}{2000}$ of an Inch; 'tis likewiſe well known, that the Diameter of a Particle viſible to the naked Eye, muſt not be leſs than $\frac{1}{100}$ of an Inch: from whence it muſt follow, that the Magnitude of one of theſe larger Blood-globules is leſs than the largeſt viſible Particle in the Proportion of 8000 to 1. And therefore, ſhould theſe Blood-globules themſelves, without any farther Attenuation or Diviſion, be ſuppoſed to paſs the glandular Secretories, they muſt come off in an extremely thin attenuated Effluvium or Vapour, the Particles of which would be 8000 times leſs than any ſenſible or viſible Particles: But 'tis certain, that the Diameters of the largeſt ſecretory Ducts or glandular Strainers, muſt be leſs than the leaſt of the Blood-globules; for otherwiſe theſe Blood-globules themſelves muſt paſs thoſe Strainers, and be thrown off in bloody Secretions, which yet we know cannot happen in a natural State of the Fluids and Solids.

How much leſs the ſmalleſt Blood-globules are than theſe larger ones here taken notice of, cannot eaſily be determined, ſince perhaps they are imperceptible, even by the beſt Microſcopes: But this is certain, that *Lewenhoek* and others, have diſcovered an Infinity of theſe ſecretory and excretory veſſels, the Diameters of which do not exceed $\frac{1}{80000}$ of an Inch, and conſequently a Fluid cannot paſs and repaſs, or be receiv'd and returned thro' theſe Circulatories, till it has been ſo far rareſy'd and volatiliz'd, as that its largeſt Particles ſhall be leſs than any viſible or ſenſible Particle in the Proportion of 512000000 to 1.

This great Rarefaction or Volatilization of the Fluids in their Circulation, or Immiſſion and Emiſſion to and from the Blood, may ſeem ſtrange to ſome; and yet it is certain, that Fluids are capable of being rarefy'd, effluviated or volatiliz'd into any aſſignable Degree of Tenuity, and that a ſingle Drop may have its Parts ſo divided and diffuſed as to poſſeſs the whole Solar Syſtem or Planetary Orb, and even ſo as to render it all opake, and hinder the Intromiſſion of one ſingle Ray of Light.

But it may here help our Conceptions the better, if we conſider how far the moſt denſe and ſolid Subſtances, as thoſe of Metals, may be attenuated, reſolv'd and volatiliz'd, actually and in Fact, by the only Help of Art.

If one Grain of Copper be firſt diſſolv'd in a little Spirit of Sal Armoniack, and afterwards mix'd with four Pints of diſtill'd, or pure limpid Water, it will give the whole Body of Water a Tinge of Blue, which will be very diſtinct and ſenſible. Now in this Caſe, a ſingle Grain of Copper has its Parts ſo far attenuated, reſolv'd and volatiliz'd, as to poſſeſs a Space above 200000 greater than it poſſeſs'd before; and yet the Vapour into which it is now driven, and which is retain'd in the Water, is ſtill viſible or ſenſible to the Eye, as the Experiment demonſtrates.

AFTER this, if more and more Water be ſtill pour'd in, the Cuprine Vapour will be more attenuated, and ſoon become inviſible; but ſtill any given Part of the Water will retain a proportional Part of the metalline Effluvia, *i. e.* as the whole Quantity of the Water to the whole Quantity of the Copper evaporated and diffuſed in it, ſo is any ſingle Drop of the Water to its proportional Quantity of the Copper or metalline Vapour.

FARTHER it has been found by Experience, that one ſingle Grain of Gold is ſufficient to over-lay or gild ninety-eight Yards of Silver Wire; and Dr. *Halley*, in the Philoſophical Tranſactions, has ſhew'd, that the Thickneſs of theſe *Lamellæ* does not exceed $\frac{1}{124500}$ of an Inch, which is leſs than the Diameter of one of thoſe ſmall excretory Tubes before taken notice of, as Matter of Fact and Obſervation.

LET us now ſuppoſe any ſuch Piece or Plate of foliated Gold, to be committed to the diſſolving Power of *Aqua Regia*; and that the *Menſtruum* ſhould act upon it no farther than to divide it into Particles, the Length and Breadth of which ſhould be only equal to the Thickneſs as before; this would reduce thoſe *Lamellæ* into ſmall Cubes, each of which would be leſs than the ſmalleſt Particle viſible to the Eye in the Proportion of 1930000000 to 1; and that the reſolving Power of ſuch a *Menſtruum*, as in the Caſe before us, may be ſtill much greater than what is here ſuppoſed, might be eaſily prov'd, and cannot be doubted of.

THE Lacteals or concoctive Strainers are allow'd to be ſome of the ſmalleſt Veſſels in an animal Body, and 'tis reaſonable to ſuppoſe that they muſt and ought to be ſo; for otherwiſe ſuch Parts and Parcels of Matter might be admitted into the Blood, which could never be diſcharged again, which muſt occaſion the moſt inveterate and incurable Obſtructions. The cutaneous Emunctories, which throw off continually the Matter of inſenſible Perſpiration, are certainly moſt exceeding fine, as appears from the extream Tenuity of the Effluvium thus diſcharged; and it cannot be doubted, but the abſorbent Veſſels or recipient Lymphaticks, which are ſpread all over the Surface of the Skin, are as fine, or rather much finer than the other; ſince otherwiſe the ſame unavoidable Miſchief muſt neceſſarily follow, and certain Parts or Portions of Matter would be receiv'd into the animal Fluids, that could never afterwards be evacuated, and which muſt therefore occaſion the moſt deſperate and mortal Obſtructions; but againſt this Nature has taken the utmoſt Precaution, and, whenever it happens, it can never be charged upon the Contrivance and Structure of the Machine itſelf.

I might here leave this as demonſtratively plain, that nothing can paſs the Lacteals or concoctive Strainers, but what is ſoluble in Water, or reducible to a Fluid by the natural concoctive Heat of the Stomach; but there are ſome ſtrong, popular Prejudices, which having been generally receiv'd, and deeply rooted, will ſtill in all Probability be ſtifly maintain'd, by the mere Dint of Authority, againſt the cleareſt Reaſons and Experiments to the contrary.

'TIS a Matter of the utmoſt Conſequence in the Practice of Phyſick, to know what Sort of Subſtances are digeſtible in the Stomach, and capable of mixing with the Blood and animal Fluids, after a Solution by the natural digeſtive Heat, and a ſubſequent Colature thro' the Lacteals and concoctive Strainers; without this Knowledge, a Man muſt always practice Phyſick in the dark, and talk and act at random with regard to the Effects of Medicines upon the Blood.

I have already demonſtrated, that nothing can paſs the Lacteals or concoctive Strainers, but in the Form of a Fluid, and even of a very fine imperceptible Vapour; and conſequently, that no material Subſtance can be tranſmitted or convey'd to the Blood, but what is either originally thus ſoluble, or reduced to ſuch a Solubility by ſome previous artificial Management: But on the contrary, it has been for many Ages, and ſtill is a generally receiv'd Opinion, that ſolid Subſtances, tho' they are not ſoluble in Water, or any potable Liquor, nor previouſly reduced to ſuch a State of Solubility or Digeſtibility, may yet be given inwardly ſo as to paſs the concoctive ſecretory Ducts, and act as *Alteratives* upon the Blood and animal Fluids. This Principle has been ſo generally eſpouſed, and ſo ſtrenuouſly adhered to in Practice, that it cannot be expected Men ſhould quit it, even upon a demonſtration *à priore*; till they are convinced by very clear and undeniable Experiments; I ſhall here therefore ſubmit to Conſideration, and to the mature Thoughts of all the learned Phyſicians of the preſent Age, the following Experiments.

EXPERIMENT I.

TAKE any given Quantity of Sulphur, Antimony, Cinnabar, or any mineral Glebe or metalline Calx of what Sort ſoever. Let this be reduced to the fineſt or ſubtileſt Powder, ſo far as it can be done by Grinding or Trituration. Let any of the ſeparate individual Particles of theſe pulveriz'd Subſtances, after their utmoſt Trituration, be view'd thro' a Microſcope, and they will appear many thouſand times larger than the Blood-globules, which Blood-globules are yet vaſtly larger than the Orifices of the Lacteals, or concoctive Strainers; and therefore cannot paſs them, without ſome farther Diviſion, Separation or Comminution.

EXPERIMENT II.

LET any of the foregoing pulveriz'd or triturated Subſtances, be committed to boiling Water, in the cloſeſt Coction, for any given time; and then the Particles being ſeparately view'd as before, they will be found to be very little, or not at all broken, comminuted or divided, by all the Force of boiling Water; but the leaſt of theſe ſeparate Particles, will after all be many thouſand times larger than the Blood-globules, and ſtill in a vaſtly larger Proportion greater than any Particles which can paſs or repaſs thro' the lymphatick Circulatories.

In this laſt Experiment, the Subſtances thus managed will loſe nothing of their Weight or Bulk, and impart no new Power or Property to the Water; from whence it is plain, that they remain juſt as they were; and that they have not been at all altered by the diſſolving, digeſtive, or attenuating Power of boiling Water; and conſequently, that they can be much leſs altered, attenuated, or diſſolv'd by the natural digeſtive Heat of the Stomach.

EXPERIMENT III.

LET any of the foregoing metalline Subſtances, in their priſtine State, be committed to ſome ſtrong acid or alkaline Spirit, ſuch as is proper to diſſolve them, which is a Thing well known to the Chemiſts; and they will hereby be reduced into the Form of a Salt, which will afterwards diſſolve in Water, and evaporate in it to any aſſignable Degree of Tenuity. The ſame thing happens by a Conflagration of Sulphur with Nitre, by which a Sal Polychreſt is generated, which will diſſolve in Water like common Salt: This is the Method of rendering mineral Glebes, and metalline Subſtances ſoluble in Water, and conſequently paſſable thro'

thro' the minuteſt concoctive Strainers; without which Management, any ſuch Intention would be vain and fruitleſs, as every one in the leaſt acquainted with Chemiſtry very well knows; of all which, the true and natural Conſequence is this, that metalline Subſtances can never be made to paſs the Lacteals, till they are previouſly altered and reduced into a Salt. Sulphur alſo, which is otherwiſe abſolutely inſoluble in Water, or in any other *Menſtruum* whatſoever, by being mix'd with equal Quantities of fix'd *Alkali*, or Salt of Tartar, and melted in a Crucible, they will run together into a red Maſs, which will be perfectly ſoluble in Water, and conſequently digeſtible in the Stomach; but without ſome ſuch previous Management, Sulphur, whatever Pretenſions it has had as an Alterative, can have certainly no Claim to it; and what has been here ſaid of Sulphur, muſt hold good with reſpect to Reſins, and all Sorts of Bodies whatever not ſoluble in Water, or previouſly reduced to ſuch a Solubility by Art. This perhaps may cut off the far greater Part of the *Materia Medica*, as an infinite Number of Things have been uſed under the Notion of *Specifick Alteratives*, that are at the ſame time abſolutely indigeſtible and inſoluble by the natural concoctive Heat; for when you have thrown out all our Boles or Earths, Teſtacea, mineral Glebes, calcined Metals, Reſins,

Stones,

Stones, the Hair, Nails, Hoofs and Bones of Animals, and other ſuch like inſoluble and indigeſtible Trumpery, the Specifick Practice will be certainly reduced to much narrower Bounds. But ſuch Things as theſe ſurely could never be intended, either as Food or Phyſick, by that Being who contriv'd and formed us upon the exacteſt Principles of Geometry and Mechaniſm, and who governs all his Works by ſome conſtant immutable Reaſons and general Laws, and not upon the fanciful precarious Hypotheſis of unknown Specifick Virtues, and immechanical occult Qualities, which he has not given us Faculties either to find out, or apply to any good Purpoſe.

EXPERIMENT IV.

LET any vegetable Subſtance, ſuch as a Bunch of Roſemary, Lavender, *&c.* green, full, and freſh gather'd, be committed to a cold Still, with a moderate, uniform Heat, not exceeding that of the Sun in Summer; and hereupon, a large Quantity of an exceedingly thin, attenuated and pellucid Vapour will ſoon ariſe; which being condenſed and forced back by the large Copper Head, will trill down into a Veſſel conveniently placed below to receive it, and there be found in the Form of Water. This however is not pure elementary Water, but contains a very ſmall Proportion of an exceedingly rareſy'd and volatiliz'd Spirit, in which the peculiar diſtinguiſhing Properties, ſuch as the Smell and Taſte, of the Plant reſide. This is really nothing elſe but the moſt volatile and attenuated Oil and Salt of the Vegetable from which it is drawn, and might properly enough be call'd the Ætherial Sapo, or prime volatile oily Salt of the Plant or Vegetable; which Ætherial Sapo, or volatile oily Salt being ſuffer'd to exhale and fly off, which it will ſoon do when expoſed to the open Air, the remaining Body is no more than common elementary Water, and has no other Properties, Qualities or Effects. This Operation performs exactly the ſame Thing as the Summer Heat; that is, it exhales and draws off the moſt pure limpid Water of the Plants, and leaves the reſt like a Skeleton dry'd and ſhrivel'd up.

If now, upon the Remainder of this Proceſs, a Quantity of pure rain Water be poured, firſt made ſcalding hot, but below the Degree of boiling, and a cloſe Infuſion be continued for a ſmall Time, as about half an Hour, there will be drawn with the remaining Water, a Quantity of Oil which will not evaporate in Air, and this mix'd with the native eſſential Salt of the Plant, which may be ſeparated from the

Water and Oil by Methods very well known, and not to be inſiſted on here.

If the ſame Subject after this, be committed to boiling Water, all the ſoluble digeſtible Oil of the Plant may be drawn off; but yet ſo as not to alter the original Texture and Conſtitution of the Solid Parts, which will remain the ſame, even in the tendereſt and moſt delicate Flowers, after all the Force and Action of boiling Water. 'Tis evident therefore, that after all theſe inferior Degrees of Heat, there ſtill remains a fix'd inſoluble Oil or Glue, which ſerves as a Cement to the Solid Fibres, and cannot be ſeparated but by the higheſt Degree of Heat by Calcination in an open Fire; and by this means the black ponderous Oil or cementing Glue being ſeparated, diſſolv'd and exhaled, the Subject thus treated falls abroad into white Aſhes, perfectly inſipid and taſteleſs, affording no Lixivium or fix'd Salt. But then,

EXPERIMENT V.

If any dry'd Plant or Vegetable, not thus previouſly treated by Infuſion or Decoction, be calcined to white Aſhes, theſe Aſhes will be impregnated with a fix'd Salt, of the ſame Nature with the Salt of Tartar; and which Salt may be ſeparated by infuſing the Aſhes upon Water, and afterwards draining off and evaporating the Solution, as is commonly known. Now by comparing thoſe two laſt Experiments, 'tis plain, that this fix'd Alkali, or Lixivial Salt, is purely and abſolutely a Creature of the Fire, and that nothing analogous to it exiſts in the original Subſtances themſelves from which they are obtain'd; for in this laſt Experiment, the Fire fixing upon the eſſential Salt of the Plant before it can fly off, in a manner vitrifies it, and turns it into a Subſtance, which might properly enough be called Soluble Glaſs. For indeed this Salt being melted with a proper Quantity of Sand, which fixes it and prevents its running per Diliquium, produces that tranſparent, hard, brittle, and inſoluble Subſtance which we call Glaſs.

EXPERIMENT VI.

FILL two thirds of a Retort with ſound, clean, white, Human Bones, ſuch as are perfectly dry, and, to Appearance, exhauſted of all their Moiſture, and let them, for the enſuing Experiment, be broken, or cut into ſmall Pieces: Thus qualify'd, commit them to Diſtillation, and there will ariſe firſt a very conſiderable Quantity of a clear limpid Water, but little different from common Elementary Water. By increaſing the Heat, white Fumes will ariſe and trickle down in ſmall Streams, or Rivulets, like Oil, into a ſharp, alkaline, pungent Spirit, which may be ſeparated into Phlegm, volatile Salt, and Oil. By increaſing the digeſtive Heat a little farther, the Oil and Salt will ariſe, but drier and leſs mix'd with Water: The Phlegm or Water being thus drawn off, a light, yellow, fœtid and very fluid Oil comes off next, which grows ſtill thicker, darker and heavier as the Heat increaſes; but at length, the Heat being rais'd to its full height, a very thick, black, fœtid, viſcous and ponderous Oil aſcends, as the laſt Effect of Fire thus apply'd.

WHAT now remains at the Bottom, is a very black, ſhining, and ſtrongly condenſed Oil, intimately mix'd and blended with Earth, which being calcined in an open Fire to the Solution and perfect Evaporation of the Oil, falls into white Aſhes purely inſipid, and without the leaſt Mixture of fix'd or lixivial Salt. The Salts and Oils obtain'd in this Proceſs, are likewiſe all Creatures of the Fire, or a Production of ſomething new; ſince they hereby acquire an alkaline Property of fermenting with Acids, which no Animal Subſtances in their natural State will ever do.

Now from theſe Facts and Experiments, generally eſtabliſh'd and well known to every Chymiſt and experimental Philoſopher, we may ſee what Sort of Subſtances, or what Principles and Parts of ſuch Subſtances are diſſoluble, reſolvable, and capable of Volatilization by any Degree of Heat, from the loweſt and moſt moderate to the higheſt and moſt intenſe: We here ſee how far the Parts of vegetable, animal and mineral Subſtances may be broken, comminuted, and reſolv'd by the natural Concoctive Heat of the Stomach and Blood, ſo as to render them capable of paſſing the Lacteals and lymphatick Recipients: And we are hereby inform'd what previous Management is neceſſary to render them thus Soluble or Digeſtible by the natural Heat, where they are not ſo originally and in their own native Conſtitution or Texture; and we are hereby likewiſe taught what Preparations and Methods of exhibiting our common Food and Nouriſhment is beſt and fitteſt to be choſen, where the Stomach is weak, the Appetite pall'd, the Natural Heat impair'd, and the Concoctive Organs indiſpoſed and out of Tune. And this is a Doctrine of ſuch Conſequence, that all good Practice depends upon it, and without which, a Man can neither reaſon well upon his own Method, nor talk with any Judgment about the Nature, Effects and Operations of Medicines in general. And yet we ſee the Materia Medica is ſtill vaſtly loaded with theſe Inſolubles and Indigeſtibles, and with a moſt unaccountable Jumble of nauſeating, ſick'ning, putrefactive Drugs, which, as they are given and daily preſcribed in Practice, under the Notion of *Specifick Alteratives*, cannot poſſibly make their way to the Blood without a Miracle, and which would do infinite Miſchief if they were there.

But the Specifician is always ſafe, he never wants Authority on his ſide, he pleads the Experience which he never had, and defies the Reaſon which he never can have. For inſtance, from a ſuppreſs'd or diminiſh'd Perſpiration a Diarrhœa is occaſioned, the Viſcera are over-loaded, and perhaps by inflaming the Meſentery and Urinary Paſſages a Fever is raiſed: Now here one would think the only Thing to be done, muſt be to reſtore the Secretions to their Natural State, and thereby reduce the Fluids to their proper Æquilibrium, which might be ſoon effected by the known Properties and Mechanical Operations of Medicines.

No, ſaith *Paracelſus*, "You are all miſ-
"taken, Gentlemen; you talk at this rate
"for want of more Experience; I have a
"Noſtrum that ſhall do the Buſineſs after

“ a moſt admirable, ſecret, and inexpli-
“ cable Manner, and without the leaſt Re-
“ gard to your pretended Laws of Animal
“ Motion and Mechaniſm. My Specifick
“ is abſolutely infallible; every individual
“ Particle of it, down to their laſt and mi-
“ nuteſt Diviſions, are perfectly acquainted
“ with their Work, and will faithfully per-
“ form it according to the beſt of their Un-
“ derſtandings. I have commiſſioned the
“ Animal Spirits to attend them, who will
“ be their ſure Guides, and conduct them
“ into every Corner and Receſs of the Ani-
“ mal OEconomy; where every ſingle
“ morbid Corpuſcle ſhall be perſonally at-
“ tack'd, whether he be found lurking in
“ his Cell, or ſtragling about the Maſs.
“ If any one of them ſhall be found too
“ large and bulky, my Emiſſaries ſhall cut
“ him into an hundred or a thouſand
“ Pieces, and leave him no bigger than
“ the reſt of his Neighbours. But where-
“ ever they are found too ſmall or diminu-
“ tive, a ſufficient Number of them ſhall
“ be amaſs'd together into one, till they are
“ brought to an ordinary Size.——Well, the
“ Thing is done, and you are my Witneſſes,
“ Gentlemen, that I have neither bled nor
“ bliſtered, vomited nor purged, ſweated
“ nor ſalivated, nor done any thing elſe
“ that I know of; but yet I have certainly
“ cured the Diſeaſe, and by a Specifick of

" my own; which, however, I ſhall not " ſubmit to a fair Tryal, leſt it ſhould diſ" cover my Art.

" I practiſe upon my own Experience, " and if it is not agreeable to *your Senſe*, " or to what they call *common Senſe*, I am " not at all concerned about it. I write as " much to the Apothecaries as any of you, " and all the Files in Town can witneſs to " the vaſt Practice I have. 'Tis true, I " never write a Bill without ſome Noſtrum " or Specifick of my own, to which the " whole Succeſs is owing, and the reſt is " only in Juſtice to the Apothecary, and to " help him off with ſome of his common " Specificks as he does me all the Service " he can in the ſame way. I cannot un" derſtand the Policy of you Mechanicians. " *Si Populus vult decipi, decipiatur:* I always " lov'd believing, reſigning Patients, and " mortally hate thoſe inquiſitive People, " who will be continually aſking a Reaſon " for Things. Give me but the Richer " Fools, and I ſhall wiſh you much Joy " of the Wiſer Sort, who have too much " Senſe to covet Money, and too much " Temperance to loſe their Health.

" Whatever you may think of it in " a way of Theory, I can tell you by Ex" perience, that Noſtrums and Specifick

" Remedies are the very Life and Soul of " Phyſick, and he who would throw them " out, and thereby ſtarve ſo noble a Cauſe " under a Pretence of the Publick Good, " perhaps ought to be firſt ſtarv'd, if not " damn'd, himſelf."

I have here given this Specifick Gentleman leave to ſpeak for himſelf, and believe I have repreſented him as ſpeaking his very Heart and Soul: But aſking Pardon for ſuch a Digreſſion, I ſhall now keep cloſe to the Point.

SCHOLIUM.

I HAVE here prov'd that Sulphurs, Boles, Reſins, mineral Glebes, calcined Metals, and ſuch like Subſtances which are inſoluble in Water, and impart no ſenſible Property to it in a warm cloſe Infuſion, or by Decoction, cannot poſſibly yield to the natural digeſtive Heat, or be ſo far volatiliz'd in the Stomach as to paſs the Lacteals, mix themſelves with the Blood, and there act as Alteratives, as has been commonly ſuppoſed. But I would not be thought hereby abſolutely to reject the Uſe of theſe Things as of no Conſequence at all in *Re Medica*.

It muſt be allow'd, that ſeveral of the Subſtances afore-mentioned, eſpecially the Compoſitions of Sulphur and Mercury, ſuch as the Æthiops and Cinnabar, by attenuating, diſſolving, and carrying off the viſcid Concretions and Foulneſſes of the Stomach and Inteſtines, thereby cleanſing and deterging thoſe concoctive Organs, and reſtoring them to their natural Action, may have a viſible good Effect upon the whole Frame, and remove many Diſorders ariſing from ſuch a Cauſe. But then no Body would call this a Specifick Operation upon the Blood, or give ſuch Purgatives and Detergents the Name of Specifick Alteratives, while they go no farther than the firſt Paſſages, and while a thouſand other Things, by the ſame Mechanical Operation upon the concoctive Organs, muſt have had the ſame Effect.

That the Stomach, Inteſtines and Lacteals conſtitute a Gland of the ſame Nature, Structure and Uſe with any other Gland, how minute ſoever, has been demonſtrated many Years ago, and need not, with regard to the Proof of it, be farther inſiſted on here. But the Conſequences of it are very important and extenſive, beyond any thing elſe in the whole Practice of Phyſick, and may therefore deſerve a little farther Explication.

EVERY Gland, whether Simple or Compound, or, as they uſe to ſpeak, Conglomerate or Conglobate, has its *Vaſa Deferentia*, *Secretoria* and *Expurgatoria*, together with its common Ventricle, where the Matter brought thither being firſt prepared by Digeſtion, Solution, and Precipitation, the more fluid, oily and nutritious Parts are ſtrain'd off by the glandular Secretories, while the groſſer, fœculent and excrementitious Parts are driven forward thro' the expurgatory Canals, and thrown out by ſome of the natural Evacuations.

IN the grand, primary, concoctive Gland above-mention'd, the Gulæ from the Mouth to the OEſophagus is its *Vas Deferens*, the Stomach is its common Ventricle, the Lacteals are its *Vaſa Secretoria*, or recipient Strainers, and the Inteſtines from the Pylorus to the Anus, conſtitute its *Vas excretorium* or common expurgatory Duct. The Actions therefore of this, as well as of every other Gland, are principally theſe four, namely Solution, Separation, glandular Colature or Secretion, and Evacuation or Expurgation; which glandular Operations I ſhall here conſider a little more diſtinctly.

WHATEVER is receiv'd into the Stomach in the Form of a Fluid, either originally ſuch, or reduced to it by ſome previous Digeſtion and Solution in Water, or common potable Liquors, requires no farther preparatory Action of the Stomach, as being already fitted and prepared for a Colature or Tranſcolation thro' the Lacteals: But the Caſe of Solids, even of the ſlighteſt and looſeſt Texture is very different, and the Proceſs of Nature in preparing, diſſolving, ſecreting and expurging theſe, ſo far as relates to the Action of the concoctive Organs, comes now to be explain'd.

1. THEN, with regard to *Solution:* Here any Solid Subſtances, whether Vegetable or Animal, intended for Aliment, are firſt broken, comminuted and ground by Maſtication, and having been ſoak'd, moiſten'd and impregnated with the Saliva, are ſwallow'd into the Stomach, and the Maſs being there farther infuſed and macerated in ſome potable Liquor, is committed to a moderate digeſtive Heat. The upper and lower Orifices of the Stomach now cloſing, and retaining its Contents for ſome time in this State of cloſe warm Digeſtion, the natural Action of Heat takes Place; the Effect of which is this: The ſmall Particles, or Globules of Air diffuſed thro' the whole

Subſtance of the digeſting Matter, being now heated and put into Action, exert their expanſive or centrifugal Force upon every Part and Particle of the digeſting Maſs; by which the Solid Parts farther ſeparate, diſunite and reſolve themſelves into their original State of Fluidity, and intimately mix with the potable Liquors and Saliva, with which they are reduced into the Form of a light, thin, frothy Gelly, not perfectly fluid, but containing many Parts of too cloſe and ſtrong a Texture and Coheſion to acquire a State of Fluidity by ſuch a Degree of Heat.

Now the digeſting Matter thus far prepared, is by the Muſcular contractive Force and Action of the Stomach thrown over the Pylorus into the Duodenum; where meeting with the Bile and Pancreatick Liquor, the fluid Parts are ſtill more ſublimated, attenuated and fluxiliz'd, and the groſſer, heavier and denſer Parts ſeparated and precipitated, which is the ſecond Action in the Proceſs of Digeſtion.

The Solid and Fluid, or the ſoluble and inſoluble Parts of the digeſting Matter being thus ſeparated by liquifying and attenuating the one, and conſequently condenſing and precipitating the other, the more fluid Part of the digeſted Matter, *i. e.* the volatile Soap or oily Salt mix'd with the Lymph, is ſtrain'd off tho' the Lacteals or lymphatick Recipients into the Blood, while the groſſer, denſer, and indiſſoluble Parts are forced downwards thro' the Inteſtines, and thrown out by the Anus, partly by the ſtimulating Cathartick Operation of the Bile, and partly by the Muſcular periſtaltick Motion of the Concoctive Organs, which is propagated directly from the OEſophagus to the Anus. And theſe are the two laſt Acts or Operations of Digeſtion which compleat the whole Buſineſs, where they are duly perform'd.

Now this being the Proceſs of Nature in Digeſtion, we may from hence eaſily conceive and deduce the ſeveral Errors of Concoction, as the digeſtive Heat ſhall be either too high or too low, the digeſting Matter more or leſs ſoluble, or as the muſcular periſtaltick Motion of the Stomach and Inteſtines ſhall be either too ſtrong and intenſe, or too weak and languid; from one of which Cauſes every Error of Digeſtion muſt neceſſarily proceed. Let us then ſuppoſe,

1. THAT the Natural digeſtive Heat is too weak, low, and languid; and from hence it will follow, that nothing but the Water of the alimentary Solids can be reſolv'd

ſolv'd and drawn off, mix'd with the moſt fluid and volatile animal Soap or oily Salt; while the reſt remains in a thick, coagulated, indigeſtible Gelly; the greater Part of what ought to nouriſh the Body not being in this Caſe ſeparable, ſoluble, and miſcible with Water by ſuch a Degree of Heat. This increaſed Quantity of the indigeſted inſoluble Matter muſt be propell'd more ſlowly, and with greater difficulty thro' the Inteſtines, and by its longer ſtay there, contract an Acidity, mix'd with ſomething of an alkaline putrefactive Ferment; in which however the Acid Principle will prevail, becauſe all the vegetable Subſtances, and moſt of the potable Liquors we take in, are diſpoſed upon Stagnation and Fermentation to put on this Form and run into ſuch an Acidity; and the animal Subſtances in this Caſe are not ſufficiently attenuated, diſſolv'd, and volatiliz'd to raiſe much of an alkaline Corruption, or putrefactive cadavorous Ferment.

Now this being the State of the Diſeaſe or morbid Digeſtion, the Corrigents of it are plainly ſuch as theſe, *ſc.* The volatile Oils and Salts, eſpecially thoſe of the Animal Kind, and ſuch as are drawn from aromatick Vegetables; the warm Bitters, Chalybiats, and the warmeſt alkaline Purgatives, or Detergents, where theſe are indicated:

For Diet, Fiſh and Fleſh Broths are moſt eligible, and Liquors impregnated with warm, ſpicy, and aromatick Vegetables; Riding, eſpecially on Horſeback, quick Immerſion in cold Water, and coming out again preſently; and in ſhort, whatever is moſt conducive to raiſe, ſtrengthen, and diffuſe the Natural Heat.

2. LET us ſuppoſe the natural digeſtive Heat to be too high, ſtrong, and intenſe, and in this Caſe the Effects and Symptoms will be ſuch as are contrary to and the reverſe of thoſe already mentioned; for the Digeſtion here will be flatulent, alkaline, and putrefactive, which is the true and natural Criterion of ſuch a morbid Concoction to every ſkilful Phyſician. And this Error of Digeſtion is the moſt common Caſe in the World with thoſe who eat and drink in the beſt way, live generouſly, and uſe but little Exerciſe: And ſince moſt of Engliſh Valetudinarians are of this Tribe, I ſhall be a little the more particular in marking out the Diſeaſe and the proper Remedies.

1. THEN, ſuch an Error of Digeſtion, by a too quick and precipitate Solution of the digeſting Matter, inſtead of a natural, regular Digeſtion, muſt run into a windy Froth, or a hot, putrefactive, and alkaline

Flatus; in which the more groſs, glutinous, and fix'd Oils and Salts, being promiſcuouſly rais'd, mix'd, and blended with the more fluid and volatile Parts of the Aliment, cannot afterwards be ſeparated, ſo as to ſtrain off the thinner and more fluxiliz'd from the groſſer, heavier, and precipitated Parts, according to the Intention of Nature. And this firſt Intention being thus eluded, a long Train of ill Conſequences muſt follow, not for want of eating and drinking enough, for this, God knows, is not the Caſe; but ſuch People eat and drink four or five times more than they ought, or than Nature is able to ſupport, digeſt, and carry off. And from hence,

2. A Perſon thus affected, finds himſelf heated, ruffled, and diſorder'd by every thing that he eats or drinks, tho' he has ſtill a craving Appetite, which he muſt gratify, with a great deal of After-Pain, Sickneſs, and Anxiety.

3. THIS hot flatulent Digeſtion continuing, the Appetite gradually weakens and decays, till at length the Stomach is quite gone from ſolid Foods, or at leaſt can take nothing of that Sort with any Guſt or Reliſh; but they find themſelves under a Neceſſity of drinking the more, eſpecially of the warmeſt and moſt generous Liquors.

And here it is that the great Miſchief begins, which the Phyſician ſeldom puts an end to but with the Life of the Patient. For,

4. The Meſentery being now tumify'd, harden'd, and grown into an unnatural Bulk, and all its Glands and nutritious Cells ſtuff'd and diſtended, with a ſapponaceous, viſcid, and concreted Oil, the Inteſtines are from hence very much conſtringed or compreſſed, and the Communication from the Stomach to the Blood, in great meaſure, intercepted and cut off by thoſe oily, viſcid, concreted Lodgments between the primary concoctive Organs and the ſecondary Glands; the Conſequences of which are too obvious to need a particular Enumeration; and I could wiſh the Effects of ſuch a morbid Digeſtion were not too commonly felt, and too well known by Experience.

From theſe two different and contrary Errors of Digeſtion, *viz.* The Cold, Hard, and Acid, and the Hot, Flatulent, and Alkaline; the concoctive Organs themſelves will be differently affected, and the muſcular periſtaltick Action of the Stomach and Inteſtines will be either too ſtrong and intenſe, or too weak and languid. And as this Indiſpoſition of the concoctive Organs depends upon the foregoing morbid Affections of the digeſting Fluids, the Effects and Conſequences of it muſt be obvious enough to any one moderately acquainted with the Animal Oeconomy.

THE direct Mechanical Effects of Medicines upon the concoctive Organs, and the various Phænomena of Nature or Symptoms of Diſeaſes from thence ariſing, are ſo numerous and important, that our Specifick Practicioners ought to underſtand this firſt and moſt obvious Principle of Animal Mechaniſm, before they talk too much of the Omniſcience and Omnipotency of their alterative Particles, which they employ on all Emergencies, upon an impracticable Commiſſion, and then explain their Action after a moſt abſurd and immechanical Manner; and of this the Specifick Mechanicians, in the Practice of Phyſick ſince *Bellini*, have convinced every Man who knows any thing of the true Laws of Motion and Animal Mechaniſm.

I have obſerv'd already, that the concoctive Organs above-mention'd conſtitute a Gland, and that every Gland in the Animal Body, how ſmall or minute ſoever, has Parts analogous to the Gula, Stomach, Inteſtines, and Lacteals, which perform the ſame analogous and reſpective Offices; in which a certain Portion or Quantity of fluid Matter is brought to the common Receptacle or Ventricle of the Gland, where after Concoction, Digeſtion, and Separation, ſome Parts of the prepar'd and ſeparated Matter are ſtrained off thro' the Lymphatick Recipients or Glandular Secretories, while the reſt, as excrementitious, is puſh'd forward by the Muſcular Periſtaltick Motion of the Glands, thro' the glandular Emunctories or excretory Ducts, in ſome of the natural Evacuations. It is true, the Muſcular Periſtaltick Motion of the other Glands and Glandular Bowels, is not ſo ſtrong, ſenſible and obſervable, as in the Stomach, Inteſtines and Meſentery; but that the ſame Motion ſubſiſts in all the reſt, and is propagated univerſally from the Centre to the Surface, in the Direction of the Arterial Blood. I have formerly demonſtrated this *à priorè*, and might now confirm it by a thouſand Experiments, was it needful; but inſtead of that, I ſhall chuſe to lay down and explain ſome of the moſt general Effects and Conſequences of this Principle, which will in Fact demonſtrate the thing itſelf.

As the Periſtaltick Motion or Muſcular Force of the concoctive Organs, is in its natural State very conſiderable and ſenſible, ſo it regulates and determines, in great meaſure, the mechanical Action of all the other Glands and Muſcular Coats univerſally; for this Gland is the prime Dirigent to all the reſt, only their Actions are reciprocal, or as the Force of this is increas'd, the Action of the others is diminiſh'd; and *è contra*, as this is diminiſh'd, thoſe are increas'd.

ALL Animal Motion is the Effect of a *Stimulus*, which in the Oeconomy of Animal Nature always ſignifies *Pain*, whether it begins in the Body or Mind; for tho' the Cauſes here may be very different, the Effects are much the ſame, and the Method of Cure the very ſame preciſely, ſo far as it depends upon Medicine: And as Pain and Pleaſure in Animal Nature have a neceſſary Relation to and Connexion with the various Degrees and Modifications of Motion in the animated ſenſitive Organs; I ſhall take the Liberty to ſubſtitute one for the other, or to uſe them both indiſcriminately in Name or Denomination, which is commonly done by the Philoſophers, with regard to the Modifications of Motion in Bodies, and the ſenſible Qualities or Senſations ariſing from them: And thus I would ſay, That *exceſſive* or *violent* Motion is *Pain*: Abſolute *Reſt* is perfect *Inſenſibility*: The Tranſition from one Extream to the other, is *Pleaſure*, and the Continuation of the ſame invariable State or Degree of Motion in the ſenſitive animated Organs, is Animal *Indolence*, or a State of Senſation without Pleaſure or Pain. And this is an eſſential Part of Animal Mechaniſm, where Thought and Senſation, or Pleaſure and Pain, are ſo naturally and neceſſarily connected with Matter and Motion, and without the Knowledge and Conſideration of it, it is impoſſible to apply Medicines in the Cure of Diſeaſes, or to underſtand the Nature and Reaſon of their Operation.

But to return, I am to explain the different Effects and Conſequences of a too ſtrong and intenſe, or a too weak and languid Motion in the primary concoctive Organs. In order to which, it will be neceſſary, in the firſt Place, to conſider how this Matter ſtands in a natural State, or where there is a due Balance and Æquilibrium kept up between the concoctive Organs, and the other Glands, and conſequently between the Solids and Fluids in general.

While the concoctive Organs perform their due Offices with a moderate Degree of digeſtive Heat and Muſcular Motion, all the other natural Secretions ſucceed well, becauſe the Muſcular Action of the Ventricles, with the refluent and defluent Tubes of all the other Glands, depend upon it. There is hardly any Diſeaſe incident to human Bodies, but what either begins or ends here; and conſequently the Cure ought to be firſt attempted, where theſe Organs come to be once affected. For tho' theſe Organs, in any Exceſs or Defect of their natural digeſtive Heat, and Muſcular Action, may not, in all Caſes, be the Root and Original of the Diſeaſe itſelf, yet, as their Action generally governs and directs all the other Solids and Fluids in their mutual Operations upon each other, and this is the only proper Seat of the direct Mechanical Effects of Medicines, it ought always to be the prime Intention and chief Care of a Phyſician.

It is evident, that tho' the Food and Liquors we take in for Nouriſhment are of vaſtly different Qualities and Properties, yet they are all alter'd in the Stomach, and transform'd into the ſame common Nature and Qualities of Fleſh, Blood, Lymph, *&c.* which contain nothing of an acid or an alkaline Nature, and will ferment with neither; and therefore it is impoſſible that Medicines ſhould act upon the Blood by their former peculiar or ſpecifick Properties, after they have undergone the Tranſmutation and Digeſtion of the concoctive Organs; and if any one ſhould doubt of this, he may eaſily convince

vince himſelf, by the moſt obvious Facts and Experiments.

Let Spirit of Wine, Spirit of Hartſhorn, Vinegar, Oil of Vitriol, Myrrh, Caſtor, Opium, or any other Subſtance of appropriated Specifick Virtue, be convey'd into the Blood, in Plaiſters, Cataplaſms, Unguents, Lotions, Fermentations, *&c.* I ſay they will have none of the peculiar Effects which we always obſerve from them when taken into the Stomach, tho' they ſhall infallibly paſs into the Blood in as large or even larger Quantities.

All Kinds of fermented, ſpirituous or inebriating Liquors, ſuch as Strong Beer, Wine, Brandy; and all Kinds of intoxicating, ſoporiferous Vegetable Subſtances, as Opium, Hemlock, Henbane, Nightſhade, *&c.* have their direct mechanical Effects upon the Stomach and Inteſtines, and diſcover no ſuch Effects or Operations when they are paſs'd into the Blood, and mix'd with the circulating Fluids, without affecting the Ventricle, or its refluent and defluent Organs in the Paſſage. I have mention'd theſe Facts, in which the Effects are very obvious, and the Trials eaſily made; but whether this or any thing elſe that might be ſaid, will be ſufficient to convince our Specifick Mechanicians or *Bellinians*,

linians, I cannot ſay; but this I am ſure of, that Men ought to talk ſomething of common Senſe upon ſuch a Subject, ſupported by Reaſon and Experience, or not talk at all.

BUT let us now conſider how the Caſe will ſtand, under the different State and Circumſtances of the primary concoctive Gland, whether its natural digeſtive Heat be too high or too low, and the Muſcular Action of its Organs too ſtrong and intenſe, or too weak and languid. And here in general every one may obſerve, that there is in Fact a conſtant invariable Alternation or Reciprocation between the Evacuation made from the primary concoctive Gland, and that which is made by Perſpiration and Sweats thro' the cutaneous Glands and excretory Ducts of the Skin. And this is ſo certain, that a Sweat raiſed always ſtops a Diarrhœa, and a Diarrhœa as certainly checks and reſtrains Perſpiration and Sweat.

SUPPOSE then, the muſcular periſtaltick Action of the concoctive Organs to be weak and languid; and 'tis evident, that this may be owing either to their too great and preternatural Relaxation or Conſtriction; either of which will impede their Action, tho' the Effects will be very different.

When the Stomach and Inteſtines are over-relaxed by a too great Quantity and Weight of Fluids falling in upon them, ſo that they cannot re-act, contract, or recover themſelves, the Conſequences will be ſuch as theſe; a low languid Pulſe, ſhort aſthmatick Breathing, hypochondriacal and hyſterical Depreſſions, or what they call Lowneſs of Spirits, an hot acrid Ferment and Flatus in the Stomach, Dropſies, Influent Fevers, *&c.* But if theſe primary concoctive Organs are too violently ſtimulated and contracted, beyond the Power of the Blood and circulating Fluids to reſtore them alternately to a due Stretch and Tenſion, the quite contrary morbid Effects will follow; ſuch as a full, quick, ſtrong, throbbing Pulſe, ſtrong, ſhort, hot Breathing, a dry hot Skin, Thirſt, Head-aches, Apoplexies, Lethargies, Boils, Botches, eryſipetalous, ſcorbutick, leprous, and other ſuch-like Eruptions, and in ſhort, all the Effects of a preternatural, effluent, and expanſive Heat.

This might eaſily be applied to the Operation of Emeticks and Catharticks, as they may be too ſtrong and violent, or too weak and ſluggiſh: In both which Caſes great Miſchief is done on the two contrary Extreams. But this Conſideration is obvious, and a natural Conſequence from what has been ſaid, that I dare truſt it to any one who is in the leaſt acquainted with the Matter.

PROPOS. II.

The true, rational and mechanical Practice of Phyſick conſiſts in regulating the natural Secretions or Evacuations, by promoting ſuch as are defective, and reſtraining ſuch as are exceſſive and redundant.

AS this Propoſition is the Ground of all rational Practice, and muſt in its Conſequences deſtroy and ſet aſide all Specifick Empyriciſm, I ſhall be a little the more particular in explaining and proving it.

ANIMAL Life conſiſts in the Heat and Circulation of the Blood, thro' conical Pipes or Canals inflected or incurv'd, of which the leſſer Baſe is in the Centre, or at the Heart, and the greater in the extreme Parts, or at the capillary evaneſcent Arteries, and naſcent returning Veins; for tho' the Aorta, in its Progreſs from the Heart, is diſtributed into innumerable Branches, yet as the Sum of the Sections of any two of theſe Branches is greater than the Section of the main Trunk, and ſo on in the ſame Proportion thro' every Diviſion and Subdiviſion of the ſame Pipes, this may be conſider'd as one truncated Cone, the Apex or leſſer Baſe of which is turn'd towards the Heart, and the larger Baſe outwardly towards the Surface or extreme Parts; and the like will hold good, and is evidently the ſame Caſe with reſpect to the returning Veins.

Now it is evident in this Caſe, that where a Fluid flows thro' a conical Pipe, or Syſtem of ſuch Pipes, that the Velocities and *Momenta Motus* of any ſuch Fluid, at the ſeveral Sections, will be reciprocally as thoſe Sections, or, which is the ſame thing, in the inverſe duplicate Ratio of their Diameters. For the Quantities of Matter paſſing at equal Section in a given time, being equal, as is evident from the Nature of Fluidity, the *Momenta* muſt be as the Velocities.

AND from hence it muſt follow, that the Velocities and *Momenta Motus* of the Blood muſt be ſtill deceaſing in its Propagation from the Heart to the Extremities or capillary Arteries, and on the contrary continually increaſing in its Return from the

Surface to the Centre. Nor can it be of any Conſequence to conſider the Lengths of ſuch Pipes or Veſſels, any more than to conſider the Length of a River from the Fountain-Head, if a Man had a Mind to compute the Velocity and Force of the Water at a given Place; and this is often a thing of vaſt Conſequence, whereas to find out the Length of the River might perhaps be impoſſible, nor could the moſt exact Knowledge of it be a thing of the leaſt Conſequence; for the Section and Velocity being given, the Force or *Impetus* of the Fluid is hereby abſolutely determin'd, and this would be juſt the ſame thing, whether ſuch Section ſhould be 2000 Miles from the Head, or not above 20 Yards. But ſince all the Blood-Veſſels are incurv'd Tubes, returning into themſelves, if any Man ſhould have a Fancy here to take the Length of the Veſſels into Conſideration, it might be ſomewhat difficult perhaps to find out the Beginning or End of a Circle; and if one Man ſhould place this Beginning of the Circle at the Heart, and reckon the Length of the Veſſels from thence, and another at the Extremities, analogous to the Progreſs and Courſe of Rivers, I ſhould not well know how to compound the Matter between them; and therefore I muſt leave ſuch a Speculation to wiſer Heads, and better Mathematicians.

I have proved already, that where the original Velocity of a Fluid, and the Sections or Diameters of the Pipes remain the ſame, the Momenta will be every-where, as the reſpective Velocities at the ſeveral Sections, or as thoſe Sections inverſely: But where the abſolute Velocity is increaſed or diminiſhed, the Momenta will be likewiſe increaſed or diminiſhed, as the Squares of thoſe Velocities. For 'tis evident, that where a Fluid flows thro' a given Pipe, or Syſtem of Pipes, the Quantities of Matter moved thro' them in a given Time, will be as the Velocities directly; *i. e.* a double Velocity will diſcharge or move a double Quantity; and conſequently the Momentum here, which is as the Rectangle under the Velocity and Quantity of Matter, muſt be as the Squares of the Velocities univerſally: But where the Sections of the Pipes or Veſſels are likewiſe different or variable, the Momenta will be ever as thoſe Sections, and the Squares of the Velocities conjunctly. Thus, ſuppoſe a Pulſe, which, in its natural State, beats 80 times in a Minute, ſhould be increaſed to 110 Pulſations of the ſame Strength, in the ſame Time: Then will the Momentum and Impetus of the Blood be increaſed as the Square of 110 to the

Square of 80, or as the Square of 11 to 8; *i. e.* as 121 to 64, which is almoſt as 2 to 1: And if we here ſuppoſe ſuch a Heat and Impetus of the Blood, to force the Veſſels outward a little, ſo as to enlarge their Diameters $\frac{1}{10}$ part, and conſequently their Sections about $\frac{1}{5}$ part: Then will the Momentum be increaſed as 121 × 6 to 64 × 5, or as 227 to 100, which is more than 9 to 4: And from hence we ſee, that ſmall Changes in the Velocity of the Blood, and Diameters of the Veſſels, may bring about great Alterations in the Heat, Rarefaction, and Impetus of this Fluid.

BUT to proceed, Since the Muſcular Action of all the Glandular Coats is propagated univerſally from the Center to the Surface, or from the Heart to the extream Parts, according to the Direction of the Arterial Blood, as I have formerly prov'd; it will be neceſſary to conſider the two different and diſtinct Surfaces to which this Motion tends, and at which the ſeveral Secretions and Evacuations are made. Now it is evident, that all the Excretory Ducts of the Glands which are deſign'd for Evacuation, or to throw any thing out of the Body, univerſally terminate in two different Surfaces, which, for Diſtinction Sake, may be call'd the External and Convex, and the Internal and Concave Surfaces: In the External

ternal Convex Surface of the exterior Skin, are terminated all the Orifices of the Cutaneous Glands, which are deſigned to throw off the Matter of Perſpiration and Sweat. In the Internal and Concave Surface of the Mouth, Throat, Stomach, Inteſtines, Bladder, *&c.* are terminated a vaſt Number of other Glandular Excretory Ducts, deſign'd to carry off and diſcharge all ſuch redundant Matter, or ſuperfluous Humours, as are projected that Way. Now the Orifices of all the Excretory Ducts which terminate in theſe two different diſtinct Surfaces, will diſcharge their reſpective Liquors in a reciprocal Proportion to each other, that is, one will be increas'd as the other is diminiſh'd; the Reaſon of which is evident, becauſe thoſe Evacuations are made in two different and contrary Directions: And from hence we ſee in Fact, that either a Diarrhœa, or any immoderate Profluvium by Urine, are check'd, reſtrain'd, and reduc'd, by promoting Perſpiration and Sweat, or by ſtrengthening and increaſing the Action of thoſe Glands, whoſe Excretory Ducts throw off their Contents in a contrary Direction; and on the other Hand, an obſtructed or leſſen'd Perſpiration brings on either an Internal Scurvy, with frequent and immoderate Diſcharges of a pale, thin, limpid Urine, a Diarrhœa, or a Fever, according to the different Circumſtances of it; which it may be worth while to conſider a little farther.

LET us then firſt ſuppoſe an obſtructed or leſſen'd Perſpiration, while all the Glands which diſcharge themſelves from the internal Concave Surface by Stool, Urine, Sputatation, &c. are free and open; and the Conſequence will be an internal Scurvy in ſome Degree or other, more or leſs, attended with a Loſs of Appetite and Strength, a Depreſſion of the Spirits, or Reflux of the Blood from the Surface to the Centre, with a hot, ſharp, windy Flatus in the Stomach, Inteſtines, and Viſcera, occaſion'd by a repelling or ſtriking back the groſſer Salts and Sulphurs, which ought to paſs off by the Cutaneous Glands, and for want of which Diſcharge, the perſpirable Matter is thrown back upon the Meſentery, Caul, Spleen, and other ſpungeous cellular and glandular Organs; and from hence theſe moſt ſpungeous and cellular Viſcera, which are provided with Glands of the largeſt Ventricles, being firſt and primarily obſtructed, only the thinner Parts of the urinous Serum can be paſſed through the Kidneys, and empty'd into the Bladder: And hence the Urines will be commonly thin, and want their natural Sediment, and conſequently will be diſcharged in immoderate

Quantities, and more pale and limpid than ordinary, as the Diſeaſe ſtrengthens and confirms itſelf upon the Habit. And if in this Caſe the Kidnies and urinous Paſſages ſhould happen to be ſo far obſtructed, by a groſs and foul Matter depoſited upon them from any of the afore-mentioned Glands, ſo that the moſt fluid Parts of the Urine cannot paſs in a ſufficient Quantity in its natural Courſe, a Dropſy preſently ariſes, which cannot be eaſily cured by any of the common Methods, and which would be farther ſtrengthen'd, confirm'd, and even render'd abſolutely incurable by ſtrong Purging. And this is the Reaſon that they who ſucceed beſt in an original ſimple Dropſy, have always the worſt Luck in a ſcorbutick Dropſy, while they do not make the Diſtinction, or ſufficiently conſider the Difference. When this obſtructed or leſſen'd Perſpiration happens to be attended with a Conſtriction of the Inteſtines, or habitual Coſtiveneſs, eſpecially in ſtrong, vigorous, and otherwiſe healthy Conſtitutions, the Scurvy will be effluent, and form ſome cutaneous eruptive Diſorder, either moiſt or dry, and either in the ſubcutaneous Glands, or on the Surface of the Skin, according to the different Circumſtances of the Diſeaſe, and the Conſtitution and Regimen of the Patient: But in this Caſe, when the Conſtitution is low and languid, eſpecially in thoſe who have weakened themſelves by Exceſſes in the Venereal Way, how ſtrong and vigorous ſoever they might have been before, the Conſequences now will be great Faintneſs and Depreſſion, a moſt vexatious, and almoſt diſtracting Flatus, an Exſiccation and Dryneſs of the Solids, and a general Waſte of the muſcular and adipoſe Fleſh, commonly call'd a nervous Atrophy. And this is one of the moſt deſperate ſcorbutick Caſes that I have ever met with, when it proceeds from the Cauſe laſt mentioned; for ſuch is the Conſtitution of this Diſeaſe, that there can be very little Hope in attempting a Cure, at leaſt without a ſtrict Abſtinence from any ſuch Sort of Depletion, which the Patient will ſeldom comply with.

But laſtly, when any obſtructed or greatly diminiſh'd Perſpiration is join'd occaſionally with any Heat and Inflammation of the Kidneys obſtructing the Urines, either originally, or by Conſent from other heated and inflam'd Organs, or from the preternatural Heat and Rarefaction of the Blood and Humours in general, the neceſſary Conſequence muſt be a Fever; which will be intermitting or continual, effluent or influent, and attended with various and different Symptoms, as a Variety of other different Symptoms may occur; but this is the true genuine Origin of every Fever, and no Fever ever ariſes and forms itſelf, without firſt affecting and obſtructing theſe two great and governing Evacuations; but where the Evacuations by the cutaneous Glands, Kidneys, and Inteſtines, are all obſtructed, Nature has no other Remedy or Refuge, but by bringing on a large and plentiful Sputation; and this Method ſhe often takes, when deny'd the Benefit of other Evacuations: Not that ſuch a Diſcharge is ever the beſt or ſafeſt, or that it is ever the true primary Intention of Nature, and therefore whenever ſhe takes this Method of her own Accord, 'tis from plain Neceſſity, and when ſhe is forced into it, 'tis from Ignorance and ill Management.

THIS Diſcharge by Spitting, Nature often attempts in the Small-Pox, and ſome other Fevers, and upon taking a great Cold, which obſtructs the other more eaſy and effectual Evacuations: But a Phyſician, who ought to follow Nature, and aſſiſt her when ſhe cannot obtain her primary and proper Intentions, ſhould never drive her into any ſuch Extremities.

IN ſhort, while the ſeveral natural Evacuations ſucceed well, and retain their due Quantities and Proportions, we always find the Perſon in Health, and we can obſerve no Diſeaſe, but what is attended with, and brought on by ſome irregular Evacuations; which being once reduced and ſet right, the Diſeaſe is cured, ſo far as Phyſick or any Power of Medicines can do it; and therefore the Cure of Diſeaſes, ſo far as Phyſick can obtain, depends on regulating the natural Evacuations.

COROLLARY.

FROM hence the Notion of ſpecifick Alteratives may appear to be a mere fictitious arbitrary Hypotheſis, without any rational Foundation or Proof at all. There is not the leaſt Reaſon or Ground in the World from any Obſervations or Experiments, to conclude that Medicines, by any ſpecifick Operation upon the Blood, can transform any morbid Matter or preternatural Ferment into good Blood and Humours; or that any ſuch corrupt virulent Matter, being once form'd and fix'd, there can be any other Way to get rid of, or to prevent its ill Effect, but by throwing it out of the Body in ſome of the natural Evacuations.

SUCH Pretenders therefore ought to ſhew, by ſome convincing Experiments, that their boaſted Specificks are capable of altering the Qualities of any morbid, purulent or noxious Matter, by being mixed with it, out of the Body, and of converting it into a Subſtance of quite different Properties, mild, innocent, and not at all inimical to Nature; and 'till they can do this, their pretended Arcana, Noſtrums, and ſpecifick Remedies, ought not to be regarded by People of the leaſt Senſe or Conſideration. 'Tis poſſible that the mild natural Operation of ſome Medicines by inſenſible Perſpiration, Sweat, and Urine, may have led ſome Men into this Notion of ſpecifick Alteratives, or the Tranſmutation of Poiſons into innocent Liquors within the Body; but our learned Empyricks are too good Naturaliſts to take Notice of ſuch Things, and will always pretend to cure Diſeaſes ſpecifically, when they do not bleed, purge, vomit, or ſalivate. But 'tis certain that Mercury, for Inſtance, does not act ſpecifically when it cures the Lues without Salivation, no more than when the higheſt Salivation is raiſed by it; for when it does not ſalivate, it yet infallibly and ſenſibly paſſes off by the cutaneous and renal Glands, and carries the peccant Matter along with it more certainly, ſafely, and effectually, than when a Salivation is raiſed.

PROPOSITION III.

The Preſſure of Fluids is an active Force, propagated inſtantaneouſly through the whole Column or Canal in which the Fluid is continued, and is not generated in time, like the accelerating Force of Gravity in the perpendicular Deſcent of heavy Bodies.

THAT all Fluids preſs upon a Baſe or Surface in Proportion to their perpendicular Altitudes, without any regard to the Weight or Quantity of Matter preſſing, is a firſt Principle in Hydroſtaticks, and ſo commonly known and admitted, that I need not be at the Trouble of proving it. And ſince every Part of the Baſe or Surface is equally preſs'd, whether it be larger or leſs, 'tis evident that the Quantity or Momentum of the Preſſure, muſt be ever as ſuch Baſe or Surface ſuſtaining the Preſſure, multiply'd into the perpendicular Height through which the Preſſure is propagated: And ſince this is always the Caſe, even where the contained Fluid is at abſolute Reſt, 'tis plain that conſtant, equal, and uniform Preſſure cannot be generated like the accelerating Forces of Gravity in falling Bodies, and that it does not depend upon any Acceleration or Motion at all.

Now when any Part of the Reſiſtance to ſuch Preſſure is taken off, as by opening a Pipe in the Side of a Veſſel filled with Water, the Fluid immediately flies out with a Velocity which is equal and uniform from the firſt Moment of its Efflux to the laſt, while the perpendicular Height or Preſſure remains the ſame: And from hence 'tis certain, that the Moment or Impetus of the effluent Fluid cannot be generated by any Fall of a Column or Cataract of the ſame Fluid within the Veſſel, through the perpendicular Height above the Orifice; and conſequently Preſſure in Fluids is a very different Force, Principle, or Law of Motion, from that of the Weight or Gravity of Bodies in general, and produces its Effects after a different Manner. For ſhould the Motion of an effluent Fluid be generated by the actual Fall of any Column or Cataract as above, it muſt follow, that the Motion of all Fluids in this Caſe muſt be accelerated for a given Time, and the Quantities diſcharged equal, whether the Heights ſhould be more or leſs, finite or infinite, which is contrary to Fact and Experience.

BUT farther, that the Preſſure of Fluids, or the Motion thence ariſing, ſhould be generated by the accelerating Force of Gravity, is impoſſible, and contrary to the Nature and general Laws of Fluidity. For let us ſuppoſe a Cylinder of a given Height to be fill'd with Water, which is always to be kept full to the ſame Height, and let an Orifice be made, or a Pipe opened, in the Side of the Cylinder, through which the Water is ſuffer'd to flow without any Reſiſtance or Perturbation; and in this Caſe, as the Diminution of Reſiſtance is inſtantaneouſly communicate to every Particle of Water within the Veſſel, every Particle will preſs towards the Part where the Reſiſtance is taken off, by the neareſt and ſhorteſt Way: And from hence it muſt follow, that every parallel Surface of the Water within the Cylinder, muſt ſubſide gradually and uniformly, ſtill retaining their Parallеliſm and original Diſtances from each other, as while they were at abſolute Reſt, and before the Motion began; or, which is the ſame Thing, the Motion will be æquable and uniform, both in the Cylinder, and through the Pipe or Orifice; but the Velocities will be reciprocally as the Sections, or as the Area of the Cylinder to the Area of the Pipe inverſely; and this is exactly the ſame Caſe as the Motion of Water in a River, where it is thrown out of a wider Canal into a narrower, and where the Motion will be ſtill uniform and æquable, but the Velocities reciprocally as the Sections; here therefore can be no Cataract, augmented Current, or accelerated Velocity of one Part of the Fluid more than the other, which Suppoſition would deſtroy all the Laws of Fluidity in general. For if Fluids were not to move in parallel Surfaces thro' all the different Sections into which they may be thrown, 'tis evident that there could be no ſuch thing as uniform Motion, or any continued Current of Fluids at all.

Preſſure therefore is an inceſſant uniform Force impreſs'd upon all Fluids univerſally, in Proportion to their perpendicular Altitudes and Surfaces preſs'd upon, independent of their Quantity of Matter, Weight, or accelerating Gravity. *q. e. d.*

COROLLARY.

FROM hence it is evident, that Preſſure in Fluids is a very different and diſtinct Law of Nature or Principle of Motion, from the Weight or accelerating Gravity of Bodies in general; ſince this Preſſure, and the Effects of it, may be the ſame, whether the Quantity of Matter be more or leſs, and, in Conſequence, one ſingle Drop of

Water may preſs againſt, and ſuſtain the whole Ocean: And therefore ſome Gentlemen, who have left ſeveral Things relating to Fluidity as moſt wonderful and unaccountable Paradoxes, have done it only by confounding two very different Laws of Nature and Principles of Motion: And thus from the Law of Impulſe, had they known no other, they might have left it as a Paradox, that a Body, from one ſingle Impulſe, ſhould continue to move on with an accelerated Velocity, which would not be only a Paradox, but an Impoſſibilty.

AND here it is indeed wonderful, that the great and incomparable *Newton*, tho' he diſcovered this Law of Fluidity, and the Effects of it, yet did not at leaſt plainly and expreſly diſtinguiſh it from the general Law of Gravity; which Obſcurity, or want of more Expreſſneſs in this one ſingle Point, has led many of his Mathematical Followers into a Difficulty which they have long labour'd under, but could never get rid of.

PROPOSITION IV.

The uniform inſtantaneous Motion produc'd by the Preſſure of a Fluid from a given Height, is the ſame which would have been generated in a given Time by the accelerating Force of Gravity, in falling from the ſame Height of the ſuperincumbent Fluid above the Orifice or Point of Efflux.

THAT one of theſe Motions is accelerated, and ariſes in Time, and the other inſtantaneous and uniform, has been prov'd already under the laſt Propoſition; and, without entering deeply into Geometry, the Truth of this Propoſition is thus plainly demonſtrable: That Water contain'd and convey'd in Pipes, will riſe to the ſame Height from which it was originally preſs'd, is evident in Fact, and well known to every Mechanick: And therefore the Force and Impetus of the Fluid from ſuch a Preſſure, muſt be equal to that which would have been obtained by an accelerating Gravity, in a Fall from that

Height freely and without Reſiſtance; for if we ſuppoſe the Force to be leſs, the Fluid could not riſe again to the ſame Height; but if greater, it muſt riſe higher than the perpendicular Preſſure from which it was produced: Both which are falſe in Fact, and contrary to Experience; and therefore theſe two Forces muſt be exactly equal according to the Propoſition, *q. e. d.*

COROLLARY I.

FROM hence it is plain, that the uniform and inſtantaneous Velocities produced by Preſſure, are the ſame with the accelerated Velocities laſt acquired by the perpendicular Deſcent of Bodies from the ſame Heights, through which ſuch Preſſure is propagated; and conſequently, that the Law of Gravity, and all its Effects, ſo far agree with the Law of Preſſure in Fluids: And thus, as in accelerating Gravity, the Spaces deſcribed, are as the Squares of the Velocities acquired in a given Time, and the Velocities, as the Square Roots of the Spaces deſcrib'd: So in the Preſſure of Fluids, the uniform æquable Velocities, are in the ſubduplicate Ratio of the perpendicular Heights, through which the Preſſure is communicated; and thoſe Heights, as the Squares of the uniform Velocities: And from hence, tho' the accelerating Gravity of Bodies in general is a very different Principle and Law of Motion from the Preſſure of Fluids, yet they may both be conſidered and compared together, and their Effects determined, and reduced to a Calculus, tho' they proceed from different Cauſes.

COROLLARY 2.

HENCE, if the perpendicular Height be call'd p, the Area or Section of the Pipe a, the Velocity v, and the Momentum or moving Force m; v will be always as $p^{\frac{1}{2}}$, or v^2 as p; as by the laſt *Corollary*. And becauſe the Quantity of Matter diſcharged in a given Time, is, as the Section, multiply'd into the Velocity, therefore q, or the Quantity of Matter, will be as $p^{\frac{1}{2}}a$: And this Expreſſion for the Quantity of Matter $p^{\frac{1}{2}}a \times p^{\frac{1}{2}}$, the Expreſſion of Velocity, gives pa; and conſequently the Momentum of the Fluid is as the Section of the Pipe multiply'd into the Square of the Velocity; or m will be ever as pa, or as v^2a; and conſequently the Sections or Orifices being given, the Momenta will be as the Squares of the Velocities, and univerſally in the compound Ratio of both.

COROLLARY 3.

HENCE likewiſe, if a Fluid be receiv'd at the Orifice, or firſt Efflux from the containing Veſſel, and convey'd through a conical Pipe, its original abſolute Velocity, which, as before, is ever as $p^{\frac{1}{2}}$, may be increas'd or diminiſh'd in any given Proportion, or *in Infinitum.*

For if the larger Baſe of the Conical Pipe be ſcrew'd or inſerted into the Orifice, the Fluid, by paſſing ſtill out of a larger Section into a narrower, will acquire continually a new increaſed Velocity; which Velocity at the outward End or Extremity of the Pipe, or its Point of Efflux, will be to its original Velocity at the containing Veſſel, as the greater Baſe of the Pipe to the leſſer; that is, reciprocally as the Sections, which may be in any given Proportion; and therefore, if the leſſer Baſe or extreme Section of the Tube be infinitely ſmall, the Velocity here muſt be infinitely great; and the contrary will happen, if the leſſer End of the Tube be inſerted into the Side of the Veſſel, for, in this Caſe, the Velocity, as before, may be diminiſh'd in a given Ratio, or *in Infinitum.*

PROPOSITION V.

The Section or Area of the Orifice with the Height of the Fluid, being given, to find the Quantity of Matter diſcharg'd in a given Time.

IF a Fluid at the Section of Efflux met with no Reſiſtance or Perturbation of Motion, but continued to flow on under the ſame Section, the Quantity diſcharged in a given Time, might be eaſily determin'd from what has been already prov'd; for the Space deſcrib'd in a given Time, with a given Velocity, being multiply'd by the Section of the Pipe or Orifice, would be equal to the ſolid Content of the Cylinder, or Quantity diſcharged in the given Time: But it is certain in Fact, and was firſt obſerved by Sir *Iſaac Newton*, that the effluent Stream contracts itſelf a little, and aſſumes a Conical Figure for a ſmall Diſtance from the Orifice, and then it reſumes its former Cylindrical Form, but under a leſs Section; and in this Caſe, the Diameter of the continued Cylindrical Steam, is to the Diameter of the Orifice only as 21 to 25; and conſequently the Sections as 441 to 625, or as one to $\sqrt{2}$ very nearly. The Reaſon of which Phænomenon I take to be this; that the Fluid at the Section or Surface of Efflux is ſtrongly attracted by the internal Concave Surface of the Pipe or Orifice. Now this Attraction of the internal Concave Parts of the Periphery being ſtronger on the Surface of the effluent Vein or fluid Steam, than on the Parts which lie more remote and nearer the Axis, muſt force the Fluid into a Conical Figure for a very ſmall Portion of Time, and then it recovers its former Cylindrical Form, and proceeds with the ſame Velocity which had been originally generated by the Preſſure, before any ſuch Perturbation had happen'd; and which original Velocity generated by the Preſſure, is now continued and ſuſtain'd, when the foregoing perturbating Cauſe ceaſes to act: And hence, while the Velocity is continu'd under a leſs Section of the Steam, the Quantity of Matter diſcharged in a given Time, will be leſſened in the Ratio of the Sections, or as 1 to $\sqrt{2}$; and from hence it follows, that an Orifice, the Diameter of which is 0,25 of an Inch, will diſcharge but the ſame Quantity in a given Time, as an Orifice 0,21 of an Inch in Diameter would do, without any ſuch Reſiſtance or Perturbation; and hence the Quantity of Matter, which, without ſuch Reſiſtance or Perturbation, would be as $p^{\frac{1}{2}}a$, will be now only as $\frac{p^{\frac{1}{2}}a}{\sqrt{2}}$: But the Quantity diſcharged in a given Time, as in one Second, may be determin'd moſt eaſily and expeditiouſly for Practice by the following Rule:

Let d ſtand for the Diameter of the Orifice, in Inches or Parts of Inches; p for the Height of the Fluid, in Feet and Parts of Feet, and let q ſtand for the Cubick Inches diſcharged in one Second of Time; and becauſe the Motion here is æquable, the Quantities flowing out in any longer or ſhorter Time, will be as thoſe Times directly: Thus at the perpendicular Preſſure of 9 Feet let the Diameter of an Orifice, through which the Water iſſues, be $\frac{1}{4}$ of an Inch, then will $53{,}32\,d^2p^{\frac{1}{2}}=q=10$, the Number of Cubick Inches which will be diſcharg'd in a Second; and ſo in all other Inſtances: But for common Water, if the Weight in Ounces Averdupoiſe be deſired, inſtead of the common Multiplier, 53,32, that of 30,86 may be uſed, which will give the Weight in ſuch Ounces.

SCHOLIUM.

WHILE I was drawing up theſe Propoſitions, I lit on a very odd and ſurprizing Book, intitled, *A Treatiſe of the Animal OEconomy*, and written by one Dr.

Robinſon, a Phyſician of *Dublin.* In this Book the Author has advanc'd ſome new and moſt unaccountable Laws of Motion in Fluids, which he endeavours to apply to the Circulation of the Blood, and the Animal Secretions.

I ſhall only conſider the Principles and Laws of Fluidity which he lays down in his firſt Propoſition, upon which he builds all the reſt, and therefore this whole labour'd Performance in the Mathematical Way, muſt ſtand or fall with this Propoſition. Now the Propoſition which he has given as ſtrict Demonſtration, and as the Foundation of all his other Inventions, is this:

" If a Fluid be mov'd through a Cylin-
" drical Pipe, made of a given Sort of
" Matter, by a Force acting conſtantly and
" uniformly during the whole Time of the
" Motion, its Velocity, ſetting aſide the
" Reſiſtance of the Air, will be in a Ratio
" compounded of the ſubduplicate Ratio
" of the moving Force directly, and the
" ſubduplicate Ratio of the Diameter and
" Length of the Pipe taken together in-
" verſely. Thus if *F* denote the moving
" Force, *D* and *L* the Diameter and
" Length of the Pipe, and *V* the Velo-

" city,

" city, I ſay V will be proportional to $\sqrt{\frac{F}{DL}}$.

Now putting H for the perpendicular Height of the Fluid above the Orifice, F will be ever as $D^2 H$; and ſubſtituting this for F, the Velocity, which is as $\sqrt{\frac{F}{DL}}$ muſt likewiſe be as $\sqrt{\frac{DH}{L}}$, as the Author himſelf determines. And this being his firſt and fundamental Principle, I ſhall examine it a little, and conſider its neceſſary Conſequences, ſuppoſing it true and demonſtrable.

1. Then ſince the Velocity, according to this Gentleman, is ever as $\sqrt{\frac{DH}{L}}$, let us ſuppoſe D and H to be fix'd or given, and take L as indeterminate and flowing, in which Caſe V, the Velocity, will be as $\sqrt{\frac{1}{L}}$; and conſequently, ſuppoſing the perpendicular Height and the Diameter of the Orifice, or, which is the ſame thing, the moving Force to be the ſame, the Velocities will be infinitely different in the reciprocal ſubduplicate Ratio of the Lengths of the Pipes. Thus if L be infinitely ſmall,

or if the Velocity be conſider'd at the Point of Efflux, without paſſing through a Pipe of any aſſignable Length, then will $\surd\frac{1}{L}$, which is the Doctor's Expreſſion of Velocity, be infinite, and conſequently the Velocity at the Point of Efflux muſt be infinitely great, whatever the Height of the preſſing Fluid and Diameter of the Orifice be; but if *L*, the Length of the Pipe, ſhould be infinite, then $\surd\frac{1}{L}$ will be infinitely ſmall, and the Velocity likewiſe infinitely ſmall, tho' the Height of the Fluid or Diameter of the Pipe, and conſequently the real Momentum, ſhould be of any given or aſſignable Quantity.

2. LET us ſuppoſe *D* as given, and then the Velocity will be as $\surd\frac{H}{L}$; in which Caſe, if *H* and *L* be ſuppoſed to flow æquably, or to be increaſed or diminiſh'd in the ſame Proportion, the Proportion of $\frac{H}{L}$ will be ever a Ratio of Equality; and then upon this Principle, the Velocities will be always equal, tho' the perpendicular Preſſures, or real moving Forces, ſhould be different in any given Proportion, or even infinitely different.

3. LET L be given, and D and H increaſed or diminiſh'd reciprocally, and then the Rectangle DH being always equal, the Velocities muſt be always equal, while the perpendicular Heights or Preſſures are increas'd or diminiſh'd in any given Proportion, or *in Infinitum.* But

4. LET H and L be given, and then the Velocity, according to the Author, will be as $\surd D$; and conſequently under the ſame Height or Preſſure of the Fluid, the effluent Velocity will be increas'd or diminiſh'd in any given Proportion, or *in Infinitum*, and this in the direct ſubduplicate Ratio of the Section of the Pipe or Orifice.

5. BUT let D and L be given, or quite thrown out of the Account, and then V will be ever as $\surd H$, or the accelerating Velocities in the ſubduplicate Ratio of the perpendicular Heights through which the Body falls, or a Preſſure is communicated. And this is the true Law of accelerating Gravity and Preſſure, as determined by *Newton*, and a Demonſtration that D and L have here nothing to do in the Matter, and cannot alter the Velocities at all.

BUT our Author, to make ſure Work of it in this firſt Propoſition as the Ground of all the reſt, proceeds farther, and gives us another Rule or Meaſure of Velocity as from *Newton*; and putting *A* for Area of the containing Cylinder, and *a* for the Orifice or Section of the Pipe, he informs us, that the Velocity of a Fluid through the Orifice *a*, will be ſuch as would be acquired by a heavy Body in falling through the Space $\frac{A^2 H}{A^2 - a^2}$. By *Prop.* 36, *Lib.* 2. *Princip. Newton.* How the learned Author ſhould come by any ſuch Principle or Law of accelerating Gravity from *Newton*, is beſt known to himſelf; but this I am very ſure of, that if he came by it honeſtly, he could not come by it wiſely, ſince he here gives us a Rule to determine the Velocity, without any Regard to the Length of the Pipe, which yet he had before prov'd to be neceſſary. But let us ſuppoſe with this learned Author, that the Velocity of an effluent Fluid preſs'd from a given Height, will be ſuch as would be acquir'd by a heavy Body in falling through the Space $\frac{A^2 H}{A^2 - a^2}$. And this being ſuppos'd, let us try the neceſſary Conſequences, and how far the Author will approve of them.

1. THEN, if the Space here deſcribed be as $\frac{A^2 H}{A^2 - a^2}$, the acquir'd Velocity

will be $\surd\frac{A^2 H}{A^2-a}$; that is, the accelerated Velocities acquir'd, will be always in the ſubduplicate Ratio of the Spaces deſcrib'd, as all Mathematicians know. Now upon this Suppoſition let the differential Quantity A^2-a^2 be infinitely ſmall, or let a be only not equal to A, and then the Expreſſion $\frac{A^2 H}{A^2-a^2}$ will be infinitely great; and conſequently the Space deſcrib'd, as well as the Velocity acquir'd, will be infinite, where the perpendicular Preſſure or Height of the Fluid is only finite and given; or, which is the ſame Thing, the Spaces deſcrib'd, and the Velocities acquir'd, will be finite and infinite at the ſame Time, and from the ſame Cauſes.

2. Let the Differential A^2-a^2 be infinitely ſmall, but negative, and then the Expreſſion $\frac{A^2 H}{A^2-a^2}$ will be negative, but infinite ſtill; the Conſequence of which muſt be, that the Fluid in this Caſe cannot deſcend and flow through the Orifice a at all; but, on the contrary, muſt aſcend perpendicularly, and flow upwards with an infinite Velocity, in a Direction quite contrary to that of Gravity.

BUT the ingenious Author, not contenting himſelf with demonſtrating ſuch Truths as theſe *à priori*, has exhibited a ſufficient Number of the moſt nice and accurate Experiments to prove them true in Fact. I ſhall not, however, pretend to follow this nice and accurate Writer in his experimental Way, and I believe the learned Reader will eaſily excuſe it, and will not think any great Apparatus of Experiments at all neceſſary to prove ſuch evident Principles as theſe, which are ſufficiently clear in themſelves, and from the Nature and Reaſon of Things, as our Author has demonſtrated.

BUT to ſpeak ſeriouſly, as the Mathematical Part of this Book is nothing but a Heap of the groſſeſt Contradictions, Abſurdities, and the moſt obvious unpardonable Blunders, it is a little aſtoniſhing, that Dr. *Cheyne*, who has been reckon'd ſo good a Judge in theſe Matters, ſhould ſpeak with ſo much Honour of the Author, and recommend the Book as a very learned and accurate Performance: But from hence 'tis plain, that Dr. *Cheyne* had either never read this Book, or, reading it, did not underſtand the Subject, or elſe, that reading and underſtanding it, he was reſolved to recommend the Book for the Author's Sake, tho' he knew the main Principles advanced in it to be falſe, contradictory, and ſubverſive of all the Laws of Nature. I ſhall therefore leave the Doctor to take which of theſe he likes beſt; but ſure it is that he muſt take one of them.

BUT to ſhew that this Author is equally judicious and accurate in experimental and mathematical Philoſophy, and that Doctor *Cheyne*'s Judgment and Approbation may equally be rely'd on in both; I ſhall here juſt conſider the Author's 24th Propoſition, and his Proof of it, where he undertakes demonſtratively to account for the natural Heat and Fluidity of the Blood. The Propoſition is this;

" *The Life of Animals is preſerv'd by*
" *acid Parts of the Air, mixing with the*
" *Blood in the Lungs; which Parts diſſolve*
" *and attenuate the Blood, and preſerve its*
" *Heat; and by both theſe keep up the Mo-*
" *tion of the Heart.*"

NOW to prove the Truth of this Propoſition, the Author lays down two or three Things as Fact, which muſt be allow'd him; but then it will evidently appear, that his Reaſonings from Facts, as well as from Principles are of the ſame Kind.

HE obſerves, that Air, and a continual Supply of freſh Air, is neceſſary to preſerve the Life of Animals; and equally neceſſary to preſerve Fire and Flame in its Action, without which it is ſoon extinguiſh'd. And he obſerves farther, that any ſtrong Acid mix'd with an alkaline Spirit or Oil, will acquire a great Degree of Heat, and even break out into actual Flame or Fire; and he owns that this Effect will be the ſame in Vacuo, or where there is no Air: But then his Concluſion from hence is very ſurprizing, that the Neceſſity of freſh Air to the Life of Animals, is owing to the ſame Cauſe with the Ignifaction which enſues upon the Mixture of Acids and Alkali's, which Effect will be the very ſame in a Vacuum, as in the open Air. But 'tis well known that all Fluids, Acids as well as others, excepting Oil, will extinguiſh Fire, and that there is nothing in Nature but Oil that Fire can feed upon; for when the volatile and fix'd Oil of any combuſtible Subſtance is conſumed and evaporated, the Fire can act no longer upon what remains, how much ſoever it may be aſſiſted and ſupply'd with Air: Acids will check and extinguiſh Fire ſooner than common Water, and any acid Vapour in the Air is more ſuffocating and deſtructive than any common watery Vapour or Fume.

BESIDES, Acids will only heat and ferment with Alkali's, but the Blood, as is very well known, is a neutral Subſtance, and will acquire no Heat or Fermentation by being mix'd with either; nay, 'tis certain in Fact, that Acids condenſe and coagulate the Blood, without raiſing the leaſt Heat or Fermentation, and that given inwardly, they always lower and abate any preternatural Heat or Rarefaction of the Blood; and therefore Phyſicians conſtantly uſe them in the moſt inflammatory Fevers, or whenever the Blood runs into a too high Degree of Heat and Fermentation; 'tis certain therefore that the Heat and Fluidity of the Blood cannot be owing to an Acid in the Air; and that conſequently this Gentleman's alledg'd Facts prove nothing at all to his Purpoſe, but rather the quite contrary.

BESIDES, he has herein quite miſtaken the Nature and Uſe of Air, and the Neceſſity of a conſtant Supply of freſh Air, in order to preſerve the Life of Animals, and the Action of Fire; for theſe Effects are not at all owing to a continual Supply of an Acid, as this Author dreams and fancies, but to the Neceſſity of a continual Supply of a proper exhaling Medium to receive and carry off thoſe copious Diſcharges of humid Effluvia or moiſt Vapour, which all living Creatures, and all combuſtible Matter under the Action of Fire, are inceſſantly emitting and throwing out; and conſequently, for want of ſuch an exhaling Medium as that of the Air, thoſe vaſt Quantities of humid Vapour being thrown back, and not diſcharged or carry'd off, the Life of Animals, and the Action of Fire, muſt ſoon be ſuffocated and extinguiſh'd, after the ſame Manner, and by the ſame Sort of mechanical Neceſſity. But to ſet this quaint Author right in all his Miſtakes and Blunders, would require a Book much bigger than his own; and therefore I may reaſonably omit any farther Conſideration of him, and leave the whole Performance to the Judgment of the Learned.

PROPOSITION VI.

The Velocity and Moment or Impetus of the Blood, are ſtill decreaſing in its Propagation from the Heart to the Extremities of the Arteries, and increaſe again in the ſame Proportion in its Reflux towards the Heart.

THE Truth of this Propoſition is evident from what has been demonſtrated *Prop.* IV. *Coroll.* 3; and here I ſhould have left it, or rather paſs'd it over as ſufficiently prov'd before, had not ſo conſiderable a Man, and ſo great a Mathematician as Dr. *Jurin*, in his Diſſertation *De motu aquarum fluentium*, aſſerted and maintain'd the contrary; namely, that the Momentum or Impetus of the Blood is greater at the Extremities of the evaneſcent Arteries, than at the Heart. The Doctor, indeed, leaves this as a Paradox; but, in my Opinion, 'tis more than a Paradox, and not true in Fact: For if we conſider, as we may, all the Arteries as one truncated Cone, the leſſer Baſe of which is at the Heart, and its greater Baſe at the Extremities of the Arteries, being equal to the Sum of all their Sections; 'tis from hence methinks evident, that the Quantities of Matter paſſing through any Section or Sum of Sections at the ſame time, being every where equal, the Impetus or Momentum of the Fluid muſt be as the Velocities, or as the Sections inverſely. But without the Application or Expence of any Geometry at all, one may fairly conclude, that the Force and Impetus of the Blood is there greateſt, where Nature has provided the Veſſels with the thickeſt and ſtrongeſt Coats, and endued them with the greateſt Degree of muſcular Force to re-act againſt the Fluids; for otherwiſe the ſmall ſlender Veſſels might burſt, and be torn to Pieces by the too great Violence and irreſiſtible Impetus of the Blood; and muſt, I think, plainly and neceſſarily be the Conſequence, were the Force and Impetus of the Blood upon the whole, greater in the evaneſcent Arteries than in the Aorta.

DR. *Jurin* indeed juſtly claims to himſelf the Honour of being the firſt Man, who, in computing the Impetus of Fluids, or the Force of running Waters, had taken the Length of the Canals or Rivers into Conſideration; but perhaps the Reaſon why others had not attempted this before, might be the Difficulty or Impoſſibility for the moſt part of aſcertaining any ſuch Lengths, and the little or no Uſe it could be of when known. And I muſt here take the farther Liberty of ſaying, that I know not what Right the learned Author could have to reckon the Beginning of the Blood Veſſels from the Heart, any more than from the evaneſcent Arteries, or incipient ariſing Veins; nor would it perhaps be eaſy to adjuſt ſuch a Controverſy concerning the Beginning of a Circle, or circular Motion.

'Tis plain that the Force or Impetus of a Fluid at a given Place or Section, where we may have Occaſion to compute it, cannot at all depend on the Length of the Canal, as it muſt neceſſarily do, were the Fluid a ſolid cohering Body, mov'd on with the ſame Velocity; for in this Caſe the Momentum, at any given Section, muſt be as the Solidity of the whole Column, or as the Section multiply'd into the Length. But this is not the Caſe of Fluids or running Waters, as all know.

But if in this Caſe the Length of the Veſſels ſhould be taken into the Account, the Impetus of the Blood, in its Progreſs from the Heart, would be ſtill decreaſing; not indeed in the ſimple, but ſubduplicate Ratio of the Velocities.

For ſince the Velocities and Momenta at the ſeveral Sections, the original Velocity at the Heart remaining the ſame, would be reciprocally as thoſe Sections, or reciprocally as the Squares of their Diameters, by what has been already prov'd; in the preſent Caſe, where the Lengths of the Veſſels are to be conſider'd, the Momenta at the Sections as before determined, muſt be increaſed in proportion to theſe Lengths; but in conical Pipes, the Lengths are as the Diameters of the Sections; and therefore putting d for the Diameter, which is alſo proportional to the Length; the Velocity will be as $\frac{1}{d^2}$ as before, and the Quantity of Matter as d, or as the Length; the Time being here ſuppoſed given. The Momentum conſequently in this Caſe, will be as $d \times \frac{1}{d^2}$, or as $\frac{1}{d}$, that is, as the Diameters of the Sections reciprocally, or reciprocally as the ſquare Roots of the Velocities. *q. e. d.* Now ſince the Sections of the Arteries, to the Sections of their correſpondent Veins are found to be nearly as 2 to 5, it muſt follow, that the Velocity of the Blood in the Arteries will be to the Velocity in their correſpondent returning Veins as 5 to 2, or reciprocally as the Sections; and therefore the Momentum or Impetus of the Blood at the correſpondent Sections of the

Veins, muſt upon the Author's own Principles, be diminiſh'd in the Proportion of $\sqrt{\frac{2}{5}}$, or nearly as 5 to 8, and yet the learned Author has here laid down another Paradox, *ſc.* that as the Impetus of the Blood is greater at the Extremities of the Arteries than at the Heart, ſo it is greater in the Veins than in the Arteries.

SCHOLIUM.

I THINK I have prov'd that ſome things laid down by the learned Author as Paradoxes are only his own Miſtakes, and wrong Suppoſitions, but, as the Matter appears to me, the greateſt Paradox of all, is that which he aſſumes at firſt, and ſets out upon, without giving us the leaſt Notice of it as a Paradox; for he roundly aſſerts that a quieſcent Weight has no Relation or Proportion at all to any Momentum, or Quantity of Matter in Motion; no more than a Line has to a Quadrangle; and if this be true, one might be apt to imagine, that when a Man ſuſtains 500 Weight on his Shoulders ſo as to keep it at Reſt, he hereby ſupports nothing at all, becauſe a quieſcent Weight is of no Moment; but if the learned Author could prove this, he would certainly deſerve more than any Man would for diſcovering the Longitude.

BUT ſurely a Quantity of Weight muſt be a Quantity of moving Force, whether it be ſufficient to overcome the Reſiſtance, ſo as to produce any ſenſible aſſignable Velocity or not, and may be demonſtrated to be equal or equivalent to a given Quantity of Motion, which would ſuſtain and ſuſpend it.

'TIS certain, that a given Fluid preſs'd from a given Height, will riſe again to the ſame Height, if not otherwiſe reſiſted; but this Motion may be ſuſpended, and the Fluid reduced to a State of Reſt by a given quieſcent Weight, namely by a Weight equal to the Weight of a Column of the ſame Fluid, whoſe Baſe is equal to the Surface preſs'd upon, and its Altitude the perpendicular Height of the Fluid above the Surface, upon which the Preſſure is made; and thus, two Columns of a given Fluid of equal Baſes and perpendicular Altitudes, will by an equal Preſſure ſuſpend each other, and reduce all the Parts of the Fluid to a State of Æquilibrium or Reſt.

TO ſay then, that the Force of Gravity in quieſcent Bodies, has no Relation or Proportion to any Quantity of Motion, ſeems to be ſaying that there is no Relation or Proportion between Cauſes and their adequate

Effects, or that they may not mutually be underſtood and explain'd by each other; for 'tis plain, that if Gravity be not a certain given Quantity of moving Force, antecedent to Motion, it could never be the Cauſe of any given Quantity of Motion, which muſt force a Man to ſay either that Motion is the Cauſe of itſelf, or that it is a neceſſary eſſential Property of mere Matter conſider'd as ſuch.

But the Author in this ſame Diſſertation *de Motu Aquarum fluentium*, is oblig'd to ſet out with another Paradox, without giving notice of it; for he tells us, that a fluid Column deſcending freely by its own Gravity, muſt continually contract itſelf *inter cadendum*, after the manner of Fluids, forced out of a wider Canal into a narrower.

" *Aqua enim cum libere, & motu accelera-*
" *to deſcendat ad normam corporum omnium*
" *gravium, neceſſario in minorem amplitu-*
" *dinem contrahitur, prout majorem velo-*
" *citatem acquirit inter cadendum.*——" Diſſert. Phyſic. Math. *p.* 31. But this Contraction of the Sections of a Fluid, as it acquires a greater Velocity, is not the common Law of Gravity, as the learned Author here ſuppoſes and aſſerts, but the Law to which Fluids are only then ſubject, when confin'd within a Pipe or Canal, and are

driven out of a wider into a narrower Section; for otherwiſe they always retain the ſame Section, whether in their direct Motion through a Canal, or by the Force of Gravity *inter cadendum.* But tho' this is no neceſſary Law of Motion in Fluids, where they are left to deſcend freely and by their own Gravity, without any other Force or Confinement; the Author was neceſſitated to ſuppoſe it here, ſince otherwiſe his Account of the Motion of Fluids by the Properties of the Hyperbola which he has here introduced, muſt have come to nothing, and a Man might have underſtood the Matter much better without any ſuch Application of Geometry.

IF a fluid cylindrical Column be ſuffered to deſcend freely by its own Gravity, without any Communication with a circumambient Fluid, it will fall through a given Space and diſcharge itſelf juſt in the ſame Time, as if it had been a ſolid Column of Ice, as the Author himſelf ſuppoſes; but to ſuppoſe here that the Velocity of the deſcending Fluid is accelerated by any other Power beſides that of Gravity, would be deſtroying the firſt Suppoſition, and introducing a new Law of Nature and Motion, not grounded upon any Reaſon or Fact.

BUT in ſhort the only Queſtion here, is, whether Preſſure in Fluids is the ſame Law of Motion with the Gravity of Bodies in general? or whether the Velocities of effluent Fluids ariſe from the accelerating Force of Gravity, and are like that generated in Time, or are produc'd inſtantaneouſly from the Power or Force of Preſſure, as different from the Force of Gravity? this is the true and only Queſtion which Doctor *Jurin* has been engag'd in, with ſo many learned Adverſaries, as good Mathematicians and Naturaliſts as himſelf, for 16 Years paſt, and at which he ſeems ſo much aſtoniſh'd. And how much ſoever the learned Author may be ſurpriz'd at it, or what Liberties ſoever he may take with thoſe who differ from him, yet I muſt beg leave to tell him, that this is a Queſtion of Importance, and which he in the way of a Cataract, or the Generation of Velocity by accelerating Gravity, will never be able to reſolve. But I ſhould not have taken this Freedom with Doctor *Jurin*, had not he himſelf made more free with ſome of the beſt and ableſt Mathematicians and Naturaliſts in *Europe*, both at home and abroad. But while he cenſures and condemns others, and is even aſtoniſh'd at their Dullneſs for not underſtanding a plain Propoſition in *Newton*; he has given but two evident

Symptoms that he never rightly underſtood it himſelf; and amidſt all his Acclamations, Wonders, and Triumphs, it might eaſily be demonſtrated, that in this Diſſertation *de motu Aquarum fluentium*, he has confounded three perfectly different and diſtinct Laws of Motion; namely the Law of communicating Motion by Impulſe, the Law of Gravity in general, and the particular Law of Preſſure in Fluids.

PROPOSITION VII.

To explain the principal morbid Conſtitutions, and the mechanical Effects of Medicines in general.

EVERY Diſeaſe incident to animal Bodies conſider'd originally, or in its primary Cauſe and Formation, muſt be referr'd either to the Solids or Fluids; and tho' theſe are naturally and neceſſarily related to, and mutually act and re-act upon each other, yet their proper original Diſorders and Diſtemperatures ought never to be confounded, ſince the Prognoſtick and Judgment of a Phyſician, concerning the Diſeaſe as curable or incurable, muſt depend upon it.

Where the natural original Structure and Conformation of any Organ is wrong, ſo as to render it uncapable of its proper Office, or where any ſuch Organ has intirely loſt its natural Structure, Conformation and Uſe, ſo as to be uncapable of returning its elaſtick Force upon the reſiſting Fluids, tho' this ſhould be brought on by ſome occaſional and accidental Cauſe, the Diſeaſe will be incurable, and it cannot be in the Power of Medicines to rectify any ſuch Diſorder. But yet the Solids may ſuffer very much from the diſtemper'd preternatural Motion of the Fluids, and yet be reſtored to their natural Office and Uſe, where their Structure and Compages are not quite broke, or their elaſtick Force and Action not wholly loſt. And from hence many Complaints and Diſorders of this Kind may be mitigated and render'd more tolerable for a Time, where no Cure can be expected or promiſed,

But in order to judge right of Diſeaſes, and the Method of Cure; I ſhall here ſet down the mechanical Operations of Medicines, which are either all that a Phyſician ought to aim at, or at leaſt ſuch, to which all the reſt may eaſily be reduced.

AND becauſe every Diſeaſe has its oppoſite, and no Medicines or Method of Cure can be right and beneficial in one Caſe, but what would be as certainly wrong and hurtful in another, I ſhall divide the mechanical Operations into theſe Six, and wait for farther Information, whether the Diviſion be juſt or not. But the mechanical Effections of Medicines, as I think, are theſe.

1. Repletion and Depletion.
2. Rarefaction and Condenſation, or, Heating and Cooling.
3. Solution or Fluxilization, and Olefaction or Inſpiſſation.
4. Derivation, and Revulſion.
5. Conſtriction, and Relaxation.
6. Stimulation, and Pacification.

I SHALL conſider theſe in their Order, ſo far as it may be neceſſary to give a clear and diſtinct Idea of the whole, and eſtabliſh the Mechanical Practice of Phyſick, independent of all the pretended occult Qualities and ſpecifick Operations of Medicines. And having done this, I ſhall leave the whole to the Judgment and Experience of ſuch Gentlemen in the Faculty as are beſt acquainted with Practice.

1. THEN, Repletion and Depletion with the ſeveral Symptoms of each, are ſo commonly underſtood, as to need no particular Deſcription or Explanation of mine. But yet there are certain Circumſtances relating to both that may deſerve ſome practical Obſervations.

A PLETHORA, or general Redundancy of the Fluids, will be either of the Blood-Veſſels, or of the Lymphaticks, Glands, and Veſicles of the adipoſe Membrane. Where the Plethora is viſibly and plainly in the Blood-Veſſels, there is one ſhort and ſure Remedy, which is by Bleeding. And this being done in a ſufficient Quantity, the Symptoms are preſently taken off. However this perhaps is not ſo often the Caſe as may be thought. But the Redundancy of the Fluids is commonly in the Ventricles of the Glands, or in the Veſicles of the cellular Membrane, which are obſtructed and preternaturally diſtended with Fat, Water, or Wind.

NOW here it may be obſerv'd, that any conſiderable Quantity of Fat, more than is neceſſary to line and lubricate the Muſcles is really a Diſeaſe, and in ſome Degree or other impairs the natural Strength, and ſhortens the Period of Life. And though ſome People may be more diſpoſed to an

Exceſs of Fat than others, yet this Redundancy is more generally owing to a wrong Regimen, than to any natural neceſſary Temperature and Conſtitution of the Blood.

THE moſt general Cauſes of this Overgrowth of Fat with us in *England*, are Indolence, or Want of Exerciſe, attended with a too free and plentiful Uſe of Ale, and a Fleſh Diet. And from hence 'tis remarkable, that Ale-houſe Keepers and Butchers are proportionally more affected with this adipoſe Diſeaſe than any others; as the Landlord is inceſſantly tippling Ale, and the Butcher continually devouring Fleſh, with which he commonly allows himſelf a ſufficient Quantity of Ale. And the Landlord at the ſame Time, while he has any Stomach at all, will eat nothing but Fleſh, and when he has quite loſt his Appetite to Fleſh, he ſtill drinks on and tipples Ale as long as he is able, but gives himſelf up as a dead Man.

I have exemplify'd this Caſe in thoſe two worthy Profeſſions, as the moſt noted Inſtance of it; not but other People of a much higher Rank may do the ſame, and no doubt but the ſame Cauſes muſt have the ſame Effects, without any regard to Rank or Condition. And tho' either of theſe Cauſes, Indolence or Want of Exerciſe, exceſſive

Ale-drinking, or a too free and liberal Fleſh Diet, may either of them be often ſufficient to raiſe an Overgrowth of Fat, yet when they are join'd together, they ſcarce ever fail, provided the Perſon be not fallen into an Atrophy before, from a preceding Plethora.

THE moſt effectual Method therefore, both of Prevention and Cure in this Caſe, is to avoid the Occaſions and Cauſes of the Diſeaſe, which may be eaſily done while it depends only upon a different Regimen or Uſe of the Non-naturals. And conſequently if a Man would not grow too fat when he finds himſelf in Danger of it, or if he would take it down when riſen upon him, let him uſe vigorous Exerciſe, eſpecially Riding, and cold Bathing; and either totally abſtain from, or be very ſparing in the Uſe of Ale and Fleſh. His Food ought at leaſt in the main to be of the vegetable Sort, his Diet-drink Water, and his Regales or Refreſhments Cyder, the weakeſt, thinneſt, and lighteſt of Wines mix'd with Water, or ſmall Punch. By this Regimen, the Diſeaſe now under Conſideration may be either prevented, or cur'd if taken in Time; but without it, vain is all the Power of Medicine and Help of Phyſicians.

IN a Dropſy or aqueous Plethora, the redundant Water which ought to paſs off by Urines, inſenſible Perſpiration, or Sweats, is either retain'd in, or thrown back upon the Ventricles of the Glands, or the Veſicles and Cells of the adipoſe Membrane. For was this redundant Water to be retain'd in, or thrown back upon the Blood; a Dropſy might be quickly and eaſily cured by Bleeding, which yet, as all know, would be a Method not only unſucceſsful but highly pernicious.

INDEED the true and natural Cauſe of this membranous Plethora, is an Obſtruction of the renal Glands and urinary Paſſages. And tho' an increaſed Perſpiration, and Sweats may diſcharge Part of the redundant Water for a Time at leaſt, yet theſe Evacuations can never long ſupply the Defect of the other, without introducing ſome other Diſeaſe not leſs dangerous or difficult to cure. And therefore the true and only Intention of Cure in this Caſe, is to recover the Evacuation by Urine, and without this, all other Methods of Relief will be ineffectual; for tho' the Water may be all thrown off and diſcharged by Purging, Sweating, Bliſtering, &c. yet if the urinary Diſcharge does not return in its natural and due Quantity and Proportion, there muſt neceſſarily be a Relapſe, and the Waters will riſe again in a little time, as we often ſee, to our great Diſcouragement and Mortification.

In this Diſeaſe therefore, the moſt effectual Diuretick Method ought chiefly to be ſtudied and regarded. For tho' other previous Evacuations may make way for this, yet this alone can be depended on for a perfect Cure. And in this caſe Catharticks may be ſo managed and directed as to have their greateſt and principal Operation by Urine. And this I take to be the great Secret of purging in Dropſies; not by fixing upon the ſtrongeſt and moſt violent, but by giving ſuch as contain in their Compoſition a proper Mixture and joint Force of an Acid and Alkaline, or a hot and cold Stimulus. For as theſe naturally ferment with, and afterwards precipitate each other, they carry off Water in the moſt eaſy and effectual way, both by Stools and Urine. And of this Method of purging off Water, I give ſome Formulæ.

℞ *Aquæ Brioniæ Comp.* ℥ij. *Elix. pp* ℥ß.
Rad. Turpeth. Mecoacannæ & *Jalapii ana.* ℈ß.
Miſce fiat Hauſtus mane ſumendus. Vel,

℞ *Rad. Jalapii* ℈*ij. Mercurii dulcis Croci & Serpentariæ Virginianæ ana. gr. xv. Elix. pp. q. ſ. miſce, fiat Bolus.*

THESE Purgatives may be repeated every other or third Day for 5 or 6 times, according to the different Circumſtances of the Patient and Indications of the Diſeaſe, of which the Phyſician muſt judge. But if they do not take effect and draw off the Waters in a Fortnight or three Weeks time, they are not to be continued longer; for tho' this Method of purging is to be prefer'd to any other, as it works beſt by Urine, and is leaſt troubleſome to weak languid Conſtitutions, yet 'tis certain that all Cathartícks too long continued or over ſtrain'd, will impair the Appetite, and at the ſame time weaken and relax the Stomach and Inteſtines, which is carefully to be regarded, not only in this, but in every other Diſeaſe. But if the Waters are not intirely drawn off, and the Diſcharge by Urine reſtor'd in this way, inſtead of continuing the Purgatives longer, the moſt effectual Method will be now, without Loſs of Time, to apply to direct and proper Diureticks.

MUCH has been ſaid about the Nature and Uſe of Diureticks, and the Gentlemen who in their firſt Studies have been betrayed ed into the Specifick Way, have talk'd moſt upon this Subject, and to the leaſt Purpoſe.

I SHALL therefore here endeavour to lay down ſomething rational and mechanical concerning it, tho' not abſolute and infallible. Which Abſoluteneſs and Infallibility is, I doubt, beyond the Province of Medicine; and I ſhall therefore leave it to better Phyſicians, or to Men who may promiſe more, and perform leſs.

WHOEVER has obſerv'd any thing of the Operation of Nature in a Diureſis, muſt have found the greateſt Profluvia of Urines to happen upon ſome accidental or artificial Precipitation of Liquors in the Stomach, after a preceding Sublimation, Heat, and Rarefaction. By this means a Diabetes is always procur'd and brought on; and by the very ſame means and method, the natural Flow of Urine is recover'd where it has been once leſſened and ſuſpended from ſome morbid Cauſe.

'TIS well known that Acids and Alkali's firſt heat and rarefy, and afterwards ſeparate and precipitate each other. But the common Diſtinction of Acid and Alkali, is not general enough to take in all that I here aim at; for in many Inſtances, Acids with Acids, or Alkali's with Alkali's, will have the ſame Effect. And therefore I only underſtand this of ſuch Subſtances, eſpecially Fluids, call them what you will, as being once mix'd, will raiſe any conſiderable and ſenſible Heat, Rarefaction or Sublimation, and then a conſequent proportional Separation, Condenſation, and Precipitation. And thus, not only Acids, as Vinegar, Juice of Lemons, Spirit of Nitre, Sulphur, *&c.* will precipitate Wine, Punch, Brandy, Rum, and other ſpirituous fermented Liquors; but Coffee, Tea, common Water, and all ſuch cooling Diluters will do the ſame, tho' not ſo remarkably or in the ſame Degree. But where-ever this Heat, Rarefaction and Sublimation, is either naturally brought on, or artificially procured, there will be the greateſt Force and Flow of Urine.

BUT then it muſt be own'd, that Medicines given upon this Principle, are to be alter'd and vary'd with reſpect to their different Forces of Heat and Rarefaction, and their conſequent Condenſation and Precipitation in the Stomach; and nothing but Experience and careful Obſervation can determine this, which is ſo different and variable in different Habits and Conſtitutions. And this may make it difficult, or perhaps impoſſible, to reduce the whole Proceſs to any fix'd general Rules, with reſpect to

Quantities, Doſes, and particular different Conſtitutions. But any judicious Obſerver will eaſily find out this, when once he knows what Principle he is to proceed on, and the means by which he is to bring about what he aims at. And this is all that I would be here thought to pretend to, only to inform others what I have obſerv'd my ſelf, and what Principle and Method of Procedure I have always found moſt ſucceſsful in Practice. And as Recipe's are always expected, I ſhall here ſet down ſome, which may take in the moſt common Caſes; tho' indeed ſuch Preſcriptions, as to their fix'd Doſes, are generally moſt depended on by thoſe who know leaſt how to make uſe of them to any good Purpoſe.

℞ *Aquæ Puleg & Bryoniæ Comp. ana ℥ij. Elix. pp, ʒij. ſpiritus nitri dulcis ʒj. Miſce fiat Hauſtus bis vel ter in Die Sumendus. Vel,*

℞ *Aqua Lactis ℥ij Salis volatilis Cornu Cervi ʒj. Solvatur Sal in Aqua & dein adde Elix. vitrioli gr.* 40. *Miſce fiat Hauſtus Modo priore Sumendus.*

I do not here ſet down theſe abſolute or proportional Quantities with any Deſign to reſtrain the judicious Phyſician from altering them as the Caſe may require. This would be only writing to old Women and

Nurſes, who can never be made Phyſicians if any one would ſweat his Heart out.

WHILE the foregoing Diuretick Draughts are given, or even without the uſe of them, I have found mercurial Diureticks of principal Efficacy to carry off the Foulneſſes of the Glands by Urine, not only in this, but in many other Caſes hereafter to be mentioned; and tho' ſometimes a ſlight Salivation will be rais'd by them when too long continued, or too cloſely plyed without Caution, yet this will be attended with no ill Conſequences, and upon deſiſting a few Days, the Symptoms will entirely vaniſh.

THE Method above propoſed of promoting the Urinary Diſcharge by a Mixture of Liquors of different and contrary Properties, as Heating and Cooling, or Acid and Alkaline, thereby occaſioning a ſudden Heat, Rarefaction, and conſequent Precipitation in the Stomach, is no great Diſcovery, but a Matter of common Obſervation and Experience, tho' too much neglected by Phyſicians. Every Man who knows any thing of Chymiſtry, muſt ſee the Reaſon of this; but whether we could aſſign a Reaſon for it or not, the Matter of Fact would be the ſame. And tho' I have given the beſt Preſcriptions to this Purpoſe, of any that I know where a Phyſician and Apothecary are at Hand, yet theſe are not abſolutely neceſſary to the End propoſed. Since there are Liquors in common uſe, that are capable of anſwering the ſame Intention, or at leaſt in great meaſure.

If therefore a moderate Glaſs of Brandy, Rum, or any other proof Spirit, be drank upon 5 or 6 Diſhes of green Tea or Coffee, the Event will be a plentiful Diſcharge by Urine, tho' neither of theſe Liquors would have had the ſame Effect alone; and this will be very much promoted and almoſt rendered Infallible, if the Perſon hereupon preſently get on Horſeback, and rides briskly for eight or ten Miles; or if the Patient cannot bear any ſuch Motion, he may be put into an open Chaiſe, and drove for an Hour, two, or three, as his Strength will admit.

But every ſuch forcing Method as this, ſuppoſes that there is no invincible Obſtruction by a Stone in the Bladder or Kidneys too big to come off. For when this is the Caſe, all ſuch forcing Methods or Precipitation of Urine, muſt prove not only ineffectual, but highly prejudicial and dangerous. And here the Judgment of ſome skilful experienced Phyſician muſt be abſolutely neceſſary.

BUT beſides thoſe already taken notice of, there is another ſort of Plethora, or Over-fullneſs and Diſtention of the membranous Cells and Veſicles, which the Learned call an Emphyſema, or, in plain *Engliſh*, a flatulent or windy Plethora; and I wiſh I could ſay that this was not too common among us, or that it had not prov'd too much the *Opprobrium Medicorum*.

IN this Diſeaſe, the Ventricles of the Glands, and the Membranous Veſicles and Cells throughout the Body, eſpecially thoſe of the adipoſe Membrane, are ſurcharged and overdiſtended with a windy Flatus, not paſſing off, as it ought to do, by Perſpiration, and the inteſtinal Excretory Ducts.

THE common Symptoms of this Diſeaſe are too well known to need any particular Deſcription of mine. This Diſorder in the Cauſe of it, is generally underſtood, but how to get rid of it, *hic labor, hoc opus eſt*.

IT may be obſerv'd in general, that ſuch Perſons are moſt liable to this hypochondriacal or hyſterick Flatus or Oppreſſion of Wind, who live in a free faſhionable way without due Exerciſe, or the Benefit of the free open Air, unleſs it be brought on by any exorbitant Paſſion, or great Emotion of the Mind, which is often the Caſe. But whatever the Cauſe or Occaſion be, the Cure will be much the ſame; and that is the principal thing here to be regarded.

'TIS certain that People labouring under this Diſeaſe, tho' the *Primæ Viæ* are very foul and ſeem to require very tight cleanſing, yet cannot bear either Emeticks or Catharticks to any conſiderable Degree, without exaſperating all the Symptoms, and thereby running a Risk which no wiſe Man would do. Here then I would propoſe the following Method, of which I have had ſome Experience, and that not altogether unſucceſsful.

FIRST, let the Stomach be waſh'd now and then, as occaſion ſerves, with a good Quantity of ſtrong Carduus Tea an hour or two before Bed-time; after the Operation of which, at going to Bed, a moderate Opiate or Compoſing Draught is to be given.

NEXT Morning let the Patient take of Elixir Proprietatis from ʒ*ij* to ℥ß. and this to be repeated at proper Intervals as the Caſe may require, or according to the Judgment of the Phyſician.

BY this means the firſt Paſſages or primary concoctive Organs may be kept clean and open without any ſuch Violence, or ſtimulating Force as the Patient in ſuch a Caſe could not bear without Injury.

WHEN this Point is a little gain'd, the next thing to be attempted, is to recover the natural Perſpiration and Sweats, which in this Malady are always leſſened and obſtructed. Now here the only effectual Method is to open and cleanſe the cutaneous Glands and excretory Ducts by Sweating, which is the true natural Purgation of thoſe Glands, as much as Emeticks and Cathartick are of the Stomach and Inteſtines.

THERE is no natural Evacuation more eaſily promoted, or the means of doing which are better known, than this of purging and deterging the cutaneous Glands and excretory Ducts by Sudorificks. But the ſureſt and moſt effectual Method of Sweating in all ſcorbutick Taints, and glandular Obſtructions that I have ever yet met with or try'd, is by Mercurials mix'd with Sudorificks, and eſpecially Opium, which when ſufficiently diluted with Carduus Poſſet-Drink, organy Tea, rheniſh Whey, or ſmall warm Punch, *&c.* proves a moſt effectual and noble Sudorifick: And indeed in all glandular and membranous Foulneſſes and Obſtructions, I take Crude Mercury or Quickſilver to be the only true univerſal

Diſſolvent and Deobſtruent in Nature, at leaſt of any thing hitherto known and experienced. And ſince we have ſo excellent a Remedy always at hand, and ſo eaſily prepared, and which may be directed to any of the Emunctories and Outlets of the Body, I know not why we ſhould neglect it, to make Room for an infinite Number of other things of leſs Efficacy, or perhaps none at all.

BUT notwithſtanding what I have here ſaid concerning the medicinal Cure of an Emphyſema, the main Thing, and what muſt be truſted to at laſt, is ſtill behind; and that is Exerciſe, eſpecially Riding, free open freſh Air, and cold Bathing. And at the ſame Time if the Diſeaſe be far advanced, eſpecially if join'd with an adipoſe Plethora and corpulent Habit, to uſe a Milk and Vegetable Diet for the moſt Part, abſtaining from all ſtrong fermented Liquors, and feeding very ſparingly upon Fleſh of any Sort.

THIS Regimen with reſpect to the Non-Naturals, is of more Conſequence than any thing elſe, and they who expect a thorough Cure by continuing in their old Way, and without altering their Method of living, only deceive themſelves, and diſgrace their Phyſicians, of which daily Experience gives us but too numerous Inſtances.

THERE is another ſort of Plethora known among us by the Name of a *Tympany*, and which is commonly reckoned a Species of a Dropſy, tho' it might perhaps be more properly call'd an hydropick Emphyſema, ſince it certainly partakes of the Nature of both. In this Malady, all the Membranes of the Abdomen and its Contents have their glandular Ventricles and Cells fill'd, tumify'd and diſtended with a frothy Viſcid, and concreſcible Lymph, ſomewhat like whipt Cream, or a Mixture of Soap and Water, in which a great Quantity of Wind or Air is retain'd. And from hence the Belly is greatly tumify'd, and at the ſame Time tight, hard, and almoſt as unimpreſſible as a Drum, from which the Diſeaſe takes its Name.

BUT notwithſtanding the exceſſive Swelling or Diſtention of the Membranes in this Diſeaſe, and tho' a great part of the retain'd Matter muſt be Water, as is evident from the Obſtruction and Diminution of Urine; yet he who ſhould treat it as a ſimple Dropſy, would find himſelf exceedingly miſtaken, ſince it rarely yields either to Diureticks or Purgatives. And tho' two or three tight ſtrong Purges may abate the Swelling, and give ſome Hopes for a Time, yet it commonly returns hereupon with renewed

Strength, and becomes more obſtinate than ever.

THE only Evacuation therefore that can here be attempted with any Safety or Certainty of Succeſs, is that which is made through the cutaneous Glands, and excretory Ducts by Perſpiration and Sweating. And here, the Mercurial Sudorificks already mention'd, are the moſt certain and effectual of any Thing that I have ever yet try'd. And in this Caſe eſpecially, they are to be prefer'd, as they not only anſwer the Intention of Perſpiration and Sweat, as well at leaſt as any thing elſe; but at the ſame time diſſolve, attenuate and liquify the indurated concreted Matter, which is to be thus diſcharged and carried off.

THIS Operation of Sweating, and eſpecially of attenuating, reſolving, and diſcharging the obſtructing concreſſible Matter from the Membranes and Parts affected, will be very much promoted and aſſiſted by applying a large Plaiſter of Diagalbanum to the whole Abdomen, in which Plaiſter ʒß. of Opium and as much Camphire have been firſt mix'd and incorporated *ex arte*. This Plaiſter may be renew'd once or twice a Week; but remov'd every Evening in order to bath or foment the Belly with a ſtrong Decoction of Elder, adding an Ounce of the beſt hard white Soap to every Pint of the ſtrain'd Liquor. After this Fomentation the ſame Plaiſter may be put on again, and thus ſerve for four or five Days or a Week.

THE healing, reſolving Power of this Plaiſter will a little inflame, and ſometimes almoſt bliſter the Skin under it, which may be troubleſome to the Patient; but this ſmall Inconveniency may be eaſily born, and is abundantly compenſated by much greater Advantages.

WHEN Perſons are ſweated under hydropical Diſorders, they will not need ſuch plentiful drinking to maintain and keep up the Sweat as in other Caſes, the Humour itſelf to be diſcharg'd in great meaſure anſwering this Intention; and a Body thus drench'd with Water before, cannot require much diluting.

BUT here perhaps it may be objected, that as hydropick Patients have commonly a great Thirſt, they cannot be ſafely ſweated without allowing them a pretty free and plentiful Uſe of diluting Liquors, leſt it ſhould inflame the external Membranes too much parch'd and dry'd before, and thereby endanger a Fever; but this is certainly a

Miſtake, and the quite contrary to what is here ſuppoſed, is true in Fact.

FOR the Reaſon of the Thirſt and Fever attending a Dropſy, is the Dryneſs and Heat of the external Membranes and cutaneous Excretories, eſpecially thoſe of the Mouth and Throat, while the Liquors which ought to paſs by thoſe external Emunctories are deriv'd inwardly, and retain'd in the glandular Ventricles and Cells of the Membranes within the Body. And from hence we find that People thus affected, as they make but a ſmall Quantity of Urine, ſo they expectorate and perſpire but very little, and ſcarce ever ſweat at all. And by this means the external Membranes and their excretory Ducts or Emunctories muſt be neceſſarily dry'd, heated, and inflamed, and a Fever raiſed with an unſatiable Thirſt, while all the internal Membranes with their Glands and Veſicles are drench'd, ſoak'd and drowned in Water. But as ſoon as the Sweats are raiſed, and a free Perſpiration reſtored, theſe Symptoms vaniſh; and the hydropick Fever is as certainly relieved by Sweating as any other Fever, and this without any ſuch Neceſſity of drinking as in other Fevers.

BUT after the Swelling in the Diſeaſe now under Conſideration has been much abated by the Method here propoſed, Diureticks will take Place, and the Evacuation by Urine may be eaſily reſtored, which could not have been done at firſt. And then the free open Air, moderate Riding, and cold Bathing, complete the Cure. And this laſt is eſpecially neceſſary, not only here, but in every other Caſe at the going off of a Plethora of what Nature or Kind ſoever; in order to contract the Veſſels which had been over-ſtretch'd and diſtended, and thereby recover their elaſtick Tone.

IN a Dropſy where the Ventricles and Cells of the Membranes have been ſo immoderately ſtretch'd and diſtended till their Lymphaticks or Aquæ-Ducts break and let out the Water into the Cavity of the Abdomen, or form ſome large Cyſterns or Membranous Baſons within the fleſhy Parts themſelves, which Receptacles of Water are continually fed and ſupply'd by Water dropping and diſtilling from the broken Lymphaticks all around; in this Caſe, I ſay, the Diſeaſe is deſperate, and tho' tapping may here relieve the Patient from time to time for a certain Space, yet the Malady may be look'd upon as incurable, and muſt at laſt prove mortal. I know ſome hiſtorical Caſes of Cures in Dropſies have been given of Perſons recovering after Tapping; and this may be true enough where the Tapping itſelf was not neceſſary, and the Patient might have done well without it; but where the Caſe is come to that State which I have above deſcrib'd; I believe no Man of any Judgment or Experience in this Diſeaſe, would warrant a Cure, or give the leaſt hope of it.

In all theſe plethorick Caſes, 'tis evident that from the Turgency and Diſtenſion of the glandular Ventricles and membranous Cells, the Blood-Veſſels muſt be very much compreſs'd and ſtraitened, the Quantity and Impetus of the Blood diminiſh'd, the Action of the Muſcles weakened, and the natural Strength impair'd. And from hence it may plainly appear how contrary Bleeding muſt be to all the Intentions of Nature under ſuch Circumſtances. The Blood is a Fluid not eaſily recruited after any great Loſs or Expence of it, whereas the Fleſh and other Fluids, after the greateſt Waſte, may be ſoon repaired, as we ſee from the moſt numerous Inſtances by daily Experience. We have too many Inſtances of this, that the Blood is ſcarce ever recruited and reſtored again to its original Force, Impetus and diffuſive Heat after any great Waſte of it, either by immoderate and exceſſive Bleeding, or by occaſional and accidental Hæmorrhages. And therefore a Phyſician ought to be very ſparing of this precious vital Liquor, to which all the natural Heat, Strength and Vigour of the Body are owing, and not raſhly throw it away, or ever part with it, without ſome very plain and urgent Neceſſity. But eſpecially in a membranous Plethora of any Sort, it may be depended on as a general Rule, that the Cure muſt be effected by ſome other Evacuations, and not by Bleeding.

HAVING made theſe Obſervations on the moſt common Caſes of a Plethora, I ſhall now take an Atrophy into Conſideration, which is the oppoſite Extream, and by which I mean in general any great Waſte of the Fleſh and Fluids, from what Cauſe ſoever it ariſes. But becauſe the Diſeaſe itſelf will differ very much, both as to its Nature and Cure, according to the different Cauſes and Occaſions by which it has been brought on; It will be proper to take notice of theſe, and to diſtinguiſh between a Glandular, Ulcerous, Lacteal, Venereal, Maniacal or Nervous Atrophy. Under one or other of theſe Diviſions, every thing will fall in, that I think neceſſary to be obſerv'd concerning Atrophies, Conſumptions and general Waſtes of the Fleſh and Fluids.

I call an Atrophy glandular from its moſt obvious and ſenſible Cauſe, when it is brought on by any exceſſive natural Evacuation or glandular Diſcharge, ſuch as a Diarrhœa, Diabetes, immoderate Sweats, *&c.* In this Caſe, the Cauſe being apparent, the curative Intention alſo is as evident, and no Man can miſtake it. But yet there may be even here, ſome things worthy of Obſervation concerning the Method of reſtraining and ſuppreſſing thoſe common Relaxations and Fluxes of the Glands, ſince it is as much the Buſineſs of a Phyſician to check and moderate ſuch Evacuations as are exceſſive and redundant, as to promote thoſe that are obſtructed and defective.

In a Diarrhœa, Aſtringents, eſpecially the Peruvian Bark and Rhubarb, will ſometimes take place; but theſe or any other Aſtringents are not always to be depended on, and we often find them ineffectual in ſome of the worſt and moſt obſtinate Caſes of this Kind, and People frequently die under all the Efficacy and Power of them. But in Diarrhœa's where the Caſe is urgent and threatning, warm abſorbent and anodyne Glyſters moderately reſtringing, have the quickeſt and moſt remarkable Effects. I have found the following Glyſter in the moſt obſtinate Caſes of this ſort ſo very efficacious and ſo ſeldom failing me, that I think it worth communicating.

℞. C. C.

℞. *c.c.c.*ʒ*iij Quinquinæ Cinnamomi ana* ʒ*j. Coque in aquæ Communis* ℔*j. Colaturæ* ℥*vi. adde aquæ Cinnamomi fortis* ℥*ij. Laudani Londinenſis a granis tribus ad octo pro re nata. Fiat Enema.*

THE Diarrhœa being once check'd and taken off by this Glyſter, repeated as occaſion ſerves, the Patient ſhould be ſweated once or twice with the Mercurial Sudorificks already deſcribed. After which, the Uſe of Riding and cold Bathing for a Fortnight or three Weeks, will ſettle the Habit and complete the Cure.

A Diabetes is a Diſeaſe more obſtinate and difficult to cure, tho' not ſo common. This might properly be call'd a Flux or Diarrhœa of the renal Glands. For thoſe Glands in a Diabetes, by a general Relaxation, and Loſs of their natural Heat and muſcular Action, are affected much after the ſame Manner as the Stomach and Inteſtines, in an alvine Diarrhœa.

THE *Briſtol* Hot-well Waters, are reckoned a Specifick in a Diabetes; and they are certainly more available as a common Drink than any thing elſe hitherto known and try'd. But they ought not only to be drank twice a Day in the common way of ſtated canonical Hours, but to be made the Baſis or Foundation of the whole alimentary and medical Proceſs in this Diſorder. But tho' theſe Waters always do ſome good, yet without other Helps, they are often, as we find, ineffectual, where the Diſtemper has been once radicated and confirm'd; and I have known many Patients, who have rely'd only on the Waters, go away from *Briſtol* not much mended. And for my own part, I doubt it would be in vain here to expect any certain Relief from Medicines, ſince we find the Diſeaſe often baffles all Attempts, and prevails againſt all poſſible Methods of Cure. But what I have found moſt available and generally ſucceſsful, I ſhall here freely and faithfully communicate.

THE checking and reſtraining the Profluvium of Urine, is, in this Caſe, the firſt and principal Intention. For tho' the Cure is not perfected as ſoon as this is done, yet ſuch a Truce gain'd with the Diſeaſe, is abſolutely neceſſary before a Phyſician can go farther, and when he has once effected this, he will have time to bethink himſelf, and look about him for the reſt.

NOW, here I take the Tincture of Cantharides to be a Medicine, that may almoſt be abſolutely depended on, for checking, reſtraining, and ſtopping the immoderate Flow of Urine. And I chuſe a Tincture of theſe Flies, which is made by infuſing or digeſting ℥ß. of them upon ℔i. of the Elixir Vitrioli. Of which Tincture, from 15 to 30 or 40 Drops may be given twice or thrice a Day, as the Symptoms may indicate. And the beſt Vehicle for this, or any other Medicine in the preſent Caſe, is the *Briſtol* Hot-well Water. But when the Profluvium has by this means been conſiderably reſtrain'd, it will be neceſſary to join with it the Peruvian Bark and Rhubarb, with the warm Aromaticks, ſuch as Cinnamon, Cloves, Nutmegs, Zedoary, *&c.* as thus:

> ℞. *Corticis de Peru, Cinnamomi, Rhab. Zedoar. ana ʒj. fiat Infuſio clauſa in aquæ bullientis Briſtolienſis* ℔i. *cola & bibat æger ℥iv. ter in die ad intervallum horarum Sex. cum guttis* 20 *Tincturæ Canthard.*

THE Tincture here directed may be increaſed or leſſened in the Quantity preſcribed, or quite left out according to the State of the Urine, and the different Symptoms which may ariſe in the Uſe of it; of which, a Phyſician will eaſily judge; but 'tis really impoſſible to make Patients Phyſicians, or to teach People in common, the

Uſe of Medicines, by all the general Rules and Preſcriptions in the World.

WHEN by this means, the Urine is reduced to its natural and due State; great care ought to be taken to reſtore the Cutaneous Evacuations, eſpecially Perſpiration, in order to confirm the Cure, and prevent a Relapſe, to which the Patient would be otherwiſe very liable. But the Methods of doing this, have been ſufficiently conſider'd and explain'd already.

AN Ulcerous Atrophy, or ſuch as is brought on by an exceſſive Diſcharge from foul running Ulcers, Wounds, and Abſceſſes, is more the Buſineſs of a Surgeon than Phyſician. But if the Ulcer or Abſceſs be internal, and out of the Surgeon's Reach and Power, as of the Lungs, Kidneys, Bladder, *&c.* vain for the moſt Part is the Help of Medicine. But even here, if the Caſe be not too far advanced and confirm'd, the Uſe of Mercurial Cleanſers and Deobſtruents, eſpecially of the Sudorifick and Diuretick Kind above-mentioned, with a Milk and Vegetable Diet, and abſtaining from all heating fermented Liquors, and theſe join'd with a conſtant Courſe of Riding and cold Bathing, will do, I think, as much as can be done in ſuch Caſes.

I COME now to what I call a lacteal Atrophy, which being a new Name, muſt be a little farther explain'd. We frequently then ſee Perſons who without any immoderate Evacuations, nay, with a general Diminution of all the natural Diſcharges, run off their Fleſh, grow Pale, Thin and Meagre, and gradually loſe their Appetite and Strength, till they are reduced at length to mere Skeletons and Scare-crows. They make but little Urine, are never lax but rather coſtive. They ſcarce ever ſweat at all, and perſpire but very little, as is evident from a low weak Pulſe, external Cold and Chillineſs, and a conſtant rough and dry Skin; yet they are continually waſting without any viſible Expences, and are not at all nouriſhed or ſtrengthened by what they take in.

THIS ſort of Atrophy, is commonly call'd Nervous, which is only a general Name for any Diſeaſe not underſtood. For to ſay a Diſtemper is Nervous, has been thought a very good and ſufficient Account of it; while the Diſeaſe itſelf, as well as the Cauſe of it, have been both equally unknown.

AFTER many Thoughts and much Perplexity about theſe odd Symptoms, I could never aſcribe this ſort of Atrophy to any thing elſe but a general Obſtruction of the Lacteals, by which the Communication of the Aliment from the Stomach to the ſeveral Parts, is in great meaſure intercepted and cut off. Upon which Suppoſition, it would be eaſy to account for all the Phænomena or Symptoms as above deſcrib'd, but that is not my Buſineſs now, and they, who are not pleaſed with this Hypotheſis, may find a better if they can.

BUT thus much I may deliver as certain, that the moſt effectual Relief in this Diſorder, is obtain'd by briſk powerful Emeticks *pro viribus*, eſpecially of the Antimonial Sort, and repeated at proper Intervals as the Caſe will admit; uſing, in the mean while, ſome mild Mercurial Deobſtruent, ſuch as may open and cleanſe the recipient Lymphaticks and the glandular Ventricles in which they terminate, without occaſioning any great or ſenſible Evacuations at firſt, till, the Stomach being clean'd, and the primary Secretory Ducts opened, the Appetite, and the Strength begin to return. And the more effectually to promote this, the Patient ought to ride every Day, or as often as poſſible, and give himſelf the moſt vigorous Exerciſe on Horſeback that he is able to bear. And when this Method cannot be follow'd, or where the Patient's Strength is too far gone for it; I doubt there will be but very little Hope left of Recovery.

A VENEREAL Atrophy, as its Name Imports, is that which is brought on by exceſſive Evacuation or Depletion in the Venereal way. And in this Caſe, the Atrophy does not often commence, or appear in many Years, or till after long Abuſes and Provocatives of this Kind, beyond all the Bounds and Requirements of Nature. But when a Man has thus brought on an Atrophy, tho' he may have eſcaped all the Taints of a Lues, yet he has certainly reduced himſelf to a very melancholy and miſerable Condition. For the hypochondriacal Symptoms attending this ſort of Waſte and Conſumption, are generally ſo grievous and tormenting, as not be compenſated or balanced by all the Pleaſures in the World. For the Nerves and muſcular Fibres in general, having hereby loſt their natural Tone, Tenſion and regular Action; the great Depreſſing, windy Inflations and Suffocations, and terrifying Deliquia hence ariſing, and the black heavy Clouds which hang upon the Brain, are almoſt inſufferable; and all the Complaints and Deſcriptions of Men in ſuch Paroxyſms, can give one but a faint Idea of the Confuſion and Diſtraction they are under. In a Word, a Venereal Hypo as I may call it, comes but little ſhort of a true Mania or Lunacy, and often terminates in it.

If any one ſhould now ask what Remedy there can be in ſuch a deplorable Caſe? the Anſwer is eaſy, That there can be no Remedy at all, but by removing the Cauſe, which is only in the Patient's own Power. But by a ſtrict and reſolute Abſtinence, join'd with a long Courſe of Riding and cold Bathing, ſuch a Conſtitution might be very much retriev'd. This alone would be ſufficient, and without it, all the Phyſicians and Medicines in the World can ſignify nothing.

A Maniacal Atrophy, or that general Waſte and Exſiccation, which we obſerve in Maniacs and Lunatics, is purely a nervous Caſe, and is not at all owing to any Diſcraſis or Diſtemperature of the Fluids. They who talk of this, have never been able to give any Proof of it in Fact, or to ſhew any ſuch Diſtemperature or morbid Qualities, either in the Blood or Humours of Perſons thus affected; nor can they ſhew any ſuch Criteria in the different State and Conſtitution of the Blood, or Liquors deriv'd from it, whereby they might be able to diſtinguiſh this Diſeaſe from any other. And I have known many of them recover all at once, and like awaking out of a Dream, where no Evacuation had been uſed, except perhaps by bliſtering the Head, and where the Cure could not poſſibly be aſcribed to any Alteration made upon the Fluids, or to the Removal of any Obſtructions from any Concretions of Matter. But this would be a Field too ſpacious, and is a Matter of too great Conſequence to be here treated of at large, and may deſerve a Tract by itſelf.

I HAVE been the more particular under this medical Proceſs of Repletion and Depletion, and the ſeveral Morbid Conſtitutions thence ariſing, becauſe it is the main Baſis and Foundation of the whole Practice, and without a due Regard to which, nothing elſe can be well effected in Phyſick. But 'tis now high time to paſs on to the other mechanical Effects of Medicines which I propoſed to conſider. And the next is,

2. Rarefaction and Condenſation, or Heating and Cooling. By a careful and due Regard to this, the natural Balance and Æquilibrium of the Blood is maintain'd and kept up, with reſpect to its primary Qualities, and the Direction of its Motion.

3. SOLUTION or Fluxilization, and Olefaction or Inſpiſſation. This Operation is of the utmoſt Conſequence in the Cure of Diſeaſes, and chiefly regards the Nature and

Conſtitution of the original Body, whether it inclines exceſſively to Fat or Lean, or whether the Habit be thin and ſpare, or full and corpulent. But I have ſaid ſo much already, under the Head of Repletion and Depletion, that I need not inſiſt farther upon this Matter here.

4. DERIVATION and Revulſion is a well known Operation of Medicines; and the Methods of effecting this, by the different Powers of Heat and Cold, are commonly underſtood, and need not be here farther explain'd.

5. CONSTRICTION and Relaxation is another Mechanical Effect and Operation of Medicines. But as this depends on the different State of the Solids and Fluids compared; it will be neceſſary to conſider the Matter ſomewhat more diſtinctly, and to lay down ſuch Obſervations and Remarks concerning it, as may ſerve to give any one a clear Idea of this Part of animal Mechaniſm.

IT may be here obſerv'd then in the firſt Place, that the conſtringed and contracted, or relax'd and diſtended State of the Solids, depend chiefly on the different Quality and Proportion of the Fluids, whether they are redundant or defective, viſcid or fluxile.

THE Powers of Heat and Cold may each, under different Circumſtances, either harden and contract, or ſoften and relax the Solids; but the exceſſive Dryneſs of the Solids, whether it proceeds from Heat or Cold, always hardens and contracts them, and exceſſive Moiſture, or redundant Humidity has the quite contrary Effect.

BUT then it may be obſerv'd farther, that there is a very great and wide Difference between the Nature and Quality of the redundant or defective Fluid, whether it be Blood or Lymph, or whether the Redundancy or Defect of the Fluids are to be conſidered in the Blood-Veſſels, or in the Glands, Lymphaticks, Tunicks, and Membranes. And this is a Diſtinction ſo neceſſary, that there can be no rational or judicious Practice without it.

IN Apoplexies, Lethargies, and other Caſes referable to theſe, there is a Redundancy of Blood, as the Symptoms evidently prove; and therefore Bleeding always relieves, provided it be done in time, and in ſufficient Quantities: But in Dropſies and Palſies the Caſe is quite otherwiſe. But having conſidered the Caſe of Dropſies already, it may not be amiſs here, to exemplify a *nervous Plethora*, which I call a *Palſy*.

In a Palſy, the Fleſh of the Limbs affected, may be generally (if not always obſerv'd) to be cold, pale, ſoft, ſmooth, and flabby; all which Symptoms or Appearances evidently prove a Defect of Blood, and a proportional Redundancy of Water, Serum, or Lymph. There can be no Occaſion for a more particular Application of this, becauſe every Phyſician muſt be convinced of it at firſt Sight; and therefore I need only obſerve farther, that the Cure of a Palſy, ſo far as it is curable at all, depends intirely upon this Principle, Theory or Hypotheſis, or what any one may pleaſe to call it; and conſequently the Cure in this Diſeaſe, and in all others that are a-kin to it, or tend towards it, is by warming and drying the Nerves, in order to give them a greater elaſtick Force, and thereby make them capable of deriving the Blood into the correſponding Muſcles.

Every Method, and all the Means that have ever prov'd effectual in a Palſy, confirm this, and prove that a Palſy is no otherwiſe an Obſtruction of the Nerves, than a common Dropſy is an Obſtruction of the Glands, and Lymphaticks in general. And from hence we always find, that the moſt powerful and effectual Deobſtruents are of little or no Uſe in a Palſy; and that a plentiful Diſcharge by Urine, which always cures a common Dropſy, cannot throw off the redundant Water or Lymph of the Nerves in this Caſe. And I cannot but think the Reaſon why Phyſicians have ſucceeded ſo little in the Cure of Palſies, has been the want of knowing or conſidering better the real Cauſe and State of the Diſeaſe. Yet thus far all the practical Writers upon this Diſeaſe agree, that Medicines which have any particular Property of heating and drying the Nerves, *i. e.* the Volatile Spirits, Oils, and Salts, are the beſt, not only internally given, but rubb'd in through the cutaneous Glands or Pores of the Skin. And this is ſo true, that though many pretended Specificks have been propoſed, and highly extoll'd, in the Caſe before us, yet little or no Good, I believe, has ever been done, but upon this obvious mechanical Principle.

IT could be of no great Conſequence, in this or any other Caſe, to multiply or magnify the *Materia Medica*, or to make any pompous Shew of Remedies, which could ſerve only to deceive and amuſe; but the Spirit of Lavender, the chymical Oil of Anniſeed, and the volatile Salts of Amber and Hartſhorn are here the Chief. But then theſe Volatiles ought to be given not in the common low Doſes, as if they were to work their Effects by Magick, or after ſome ſecret inexplicable Manner ; but in much larger Quantities, ſo as to raiſe a pretty free and plentiful Sweat for ſix or eight Hours at leaſt, the Patient in the mean while keeping his Bed, and uſing proper Diluters to prevent a Fever, or any Inflammation of the Blood. And this is but a neceſſary Precaution in all other Caſes, where Sweating is aim'd at and directed.

But the main thing to be depended on in this Caſe is bliſtering, eſpecially of the Head and Spine, as the Brain and ſpinal Marrow are principal Seats of this ſort of redundant Humidity or Dropſy. And here, as indeed I think in all other Caſes univerſally, the Epiſpaſticks ought to lie on as long as they will run without dreſſing ; ſince in ſuch a Way they will diſcharge a great deal more, and with leſs Pain and Trouble to the Patient.

But among the Volatiles before recommended, I had forgot to mention *Camphire*, which yet I think is the Principal of them all, and might ſerve *inſtar omnium*. And this may be given from half a Scruple to a Dram in any convenient Diſſolvent, and repeated as Occaſion ſerves. But then, as ſome Stomachs will not ſo eaſily bear this, the Phyſician muſt make the beſt Choice he can, from what he finds of the Temper and Conſtitution of his Patient: Only obſerving this, that the volatile Sudorificks, or Diaphoreticks, are here to be preferr'd as moſt proper and effectual in the Caſe.

THE oppoſite morbid Conſtitution to this which I have now deſcribed, is a Mania, hot or cold, Effluent or Influent, or, which is the ſame thing, a raving Madneſs, or a low melancholy Diſtraction. In both theſe Caſes there is a very ſenſible and remarkable Dryneſs of the Nerves, which makes them too ſtiff, tenſe, and elaſtick, as long as the Blood is able to ſuſtain and ſupport that elaſtick Power; and when it is not, the Patient will die with the Nerves dry'd, fix'd, and ſtiffen'd, either by Heat or Cold.

BUT beſides the Dryneſs and Rigidity of the Nerves, which may happen in ſeveral other Caſes, where there is no maniacal Diſpoſition, there is another thing here to be taken into Conſideration, as the eternal Fore-runner and Occaſion of Diſtraction of every kind, whether high or low, hot or cold; and that is *Want of Sleep* for a long Time together, from ſome great over-bearing Paſſion or Perturbation of the Mind. This is ever the Caſe, where any ſort of Diſtraction comes on gradually, and any previous Cauſe of it can be aſſign'd; but then I muſt own, that ſometimes Madneſs or Diſtraction may ſeize a Perſon all at once, from a ſudden Emotion of *Fear*, *Grief*, or *Joy*; where there had been no antecedent Cauſe of it, or Diſpoſition towards it: But where this Diſtemperature of the Nerves has not been occaſioned and brought on by want of Sleep, it always prevents Sleep for the future; and 'tis this alone that fixes and confirms the Diſeaſe.

It may be here ſaid, and will doubtleſs be objected, that in a hot raving Madneſs, as well as in a melancholy cold Diſtraction, the Patients often ſleep for ſeveral Hours, or ſome conſiderable Time together, and awake juſt as they were before; and conſequently Want of Sleep cannot be the Cauſe either of the firſt Formation, or Continuance and Fixation of the Diſtemper. But I affirm, that in this Caſe there is little or no Difference between ſleeping and waking; and the Perſon thus affected, is ſtill in the ſame Dream, has the ſame Scene before him, and the ſame Impreſſions upon his Imagination; whether you would pronounce him aſleep or awake; They ſleep while they are awake, and are awake in their Sleep; and whether they ſleep or wake, they are ſtill in the ſame Dream, and their Nerves are in the ſame mechanical diſtemper'd Motion, which repreſents to them the ſame Appearances and Images in both Caſes: Nor is it poſſible to cure them, but by ſome Method or other, which may ſtop this irregular Motion of the Nerves, and bring them to ſleep ſound without dreaming. And I have had ſo many Inſtances of this, and ſo much Experience of it for ſeveral Years paſt, that I may venture to pronounce it as a thing certain, and without Exception.

BUT how to procure ſound Sleep, and pacify the Nerves in ſuch Caſes, *hic labor, hoc opus eſt*; in a hot raving Madneſs, the common Methods of cooling, diluting, and evacuating, often take effect in a little Time; but very ſeldom, or rather never at all, in a cold melancholick Diſtraction: So far from it, that the Method which in one Caſe by tempering the preternatural Heat, taking off the Rage, and procuring Sleep, will cure the Diſeaſe; muſt in the other move, confirm, and fix it, and very often render it abſolutely incurable; of which I have known many Inſtances.

BUT how to pacify this occaſional and diſtemper'd Impetus of the Nerves, and procure ſound Sleep in all the Species, and under all the different Circumſtances of maniacal and melancholick Diſtraction, is a

Subject of too large Extent, and of too great Importance to be juſtly treated of here; and therefore I ſhall take the firſt Opportunity to lay before the World my Reaſonings, Experience, and Obſervations about it, in a particular Treatiſe by itſelf.

6. The laſt mechanical Operation of Medicines which I propoſed to conſider, is Stimulation and Pacification, or, which is the ſame thing, increaſing or leſſening the elaſtick Force, and Vibrations of the Nerves, and thereby regulating their Motion, whether its Exceſs or Defect ſhall appear to be external or internal, effluent or influent. To excite and ſtrengthen the mechanical Motion of the nervous or muſcular Fibres, where it is too languid and remiſs, and to pacify and quiet it when too ſtrong and intenſe, is what deſerves the Conſideration of every Phyſician. For this medical Operation muſt certainly be of the greateſt Conſequence of all, as it conſiſts in regulating the oppoſite or counter Forces, in the mutual Action and Re-action of the Solids and Fluids upon each other. And here I ſhall be the larger and more particular upon this Propoſition, as every thing hitherto advanced may be look'd upon only as paving the Way to it.

THAT all muſcular Motion or Action of the Solids, depends upon a Stimulus, or a certain Degree of Pain or Uneaſineſs, ariſing either from the Body or the Mind, or from an external or internal Cauſe, is evident in Fact. This I had demoſtrated many Years ago, in my Philoſophical Principles of Medicine; and to which I have never yet met with any Objections, either in a private or publick Way. But though this has not been objected to in my Reaſonings, *à priore*, yet I ſhall make it ſtill clearer in Fact, by ſome following Propoſitions. But in the mean while, I muſt here purſue a little farther the Subject I am now upon.

THE Effects and Properties of ſtimulating and pacifying Medicines in general, is a Matter commonly underſtood, and never diſregarded by a good Phyſician. But the particular Management of ſuch Medicines, how they are to be directed, and to what Degree they ought to be raiſed, under the various Caſes and Circumſtances which may occur in Practice, is a Buſineſs of ſome Conſequence; and which may, perhaps, deſerve a little farther Conſideration.

I MUST here reſume the Diſtinction which I have already ſettled and explain'd, between the Secretions which are drawn off and diſcharged from the internal and external Surfaces: For 'tis evident from what has been before obſerv'd, and prov'd, that the Direction of muſcular Motion in theſe two, is directly oppoſite, and reciprocally proportional; ſo as that the Augmentation of the one is the Diminution of the other inverſly.

BUT before this Matter can be well explain'd, we muſt conſider the different Nature of Stimuli, which are either hot or cold; or, to ſpeak more technically, acid or alkaline. Now this Diſtinction being obſerv'd, I may lay it down as a general Rule in Practice, that a cold Stimulus upon the external Surface, is a Derivation of Matter from the internal Surface; or it augments the Secretions at the external, and diminiſhes them at the internal Surface, by directing the muſcular ſecretive Force towards the Parts thus impreſs'd and ſtimulated: And on the other hand, a cold, ſaline, or acid Stimulus upon the Stomach, Inteſtines, or any where at the internal Surface, will have a quite contrary Effect; by increaſing the Secretions at the internal, and diminiſhing thoſe at the external Surface: And this is ſo certain a Rule in Practice, that I ſcarce know of any Exception to it in ordinary Caſes. This is the Nature of a cold Stimulus, ſo far as it is medicinal and ſalutary; but otherwiſe in its preternatural Extreams, it may have very different and even contrary Effects, by obſtructing and ſhutting up all the Secretions, whether from the internal or external Surfaces.

BUT a hot Stimulus is ſomewhat different, becauſe Heat is always diffuſive, whether it be apply'd to the internal or external Surface; and thus a hot Medicine will have much the ſame Effect as a warm Sun, or ſtrong Fire: But there is this Difference, that Cold always conſtringes and contracts, but Heat relaxes and ſtretches the Nerves; provided it be not ſtrong enough to criſp, dry, and ſcorch them, as conſidered before. For in all the Effects of Heat and Cold, the Degree of Moiſture or Humidity attending them, ought to be carefully obſerv'd, and taken into the Account: But of this I have diſcourſed ſo largely already, that I need ſay no more of it here.

PACIFYING or compoſing Medicines always act by their warm Oils, and grateful Effluvia immediately upon the Nerves: And from hence, by exciting an agreeable and placid Senſation, they take off any painful Stimulus, whether ariſing from the Body or Mind; and by this Means they reduce any ſtrong, irregular, and violent Motions of the nervous elaſtick Fibrillæ, to a ſmooth, even, eaſy, and regular Undulation.

Now here, though all vinous Spirits, and volatile Oils and Salts have, in ſome Degree, the ſame Effects, yet the capital thing of all is Opium. A moſt wonderful and divine Remedy, as it is a Preparation of Nature, to relieve Mankind from ſome of the greateſt Diſtreſſes they can poſſibly labour under ; and I may venture to ſay, that though ſome Men more artfully than honeſtly declaim againſt it, yet no Phyſician could practiſe without it. It is very true, that this or any other Medicine may be apply'd injudiciouſly and wrong, and in ſuch Caſes do Miſchief ; But, ſurely, he who does not know how to apply it right, knows very little or nothing of the Practice of Phyſick. For my own Part, who never aim'd much at Diſguiſes, I have known ſeveral Gentlemen of the Profeſſion, who have been continually declaiming againſt Opium, and who yet at the ſame time ſcarce ever give any thing without it. But to do Juſtice to this and Quickſilver, which are the true natural Corrigents of each other, and to ſhew their vaſt Efficacy and Uſefulneſs in ſome of the greateſt and moſt difficult Caſes of Cure, would require a

Treatiſe by it ſelf ; and which, perhaps, might be of ſome Service to the World.

PROPOSITION IX.

The peculiar and ſpecifick Qualities and Properties of acid and alkaline Medicines, are intirely alter'd and deſtroy'd by the digeſtive Action of the Stomach, before they can be convey'd to and mix'd with the Blood.

THIS is evident in Fact, from all Profeſſor *Boerhaave*'s Proceſſes upon Animal Subſtances, taken in their natural State, as Blood, Lymph, Milk, Urine, Fleſh, Bones, *&c.* In all which he could never find any thing of an Acid or Alkali, but ſomething of a neutral Kind, which would ferment with neither. And from hence it neceſſarily follows, that the digeſtive Heat, Fermentation, and Action of the Stomach deſtroys all ſuch acid and alkaline Properties, in Things given as Medicines, and ſends them to the Blood under a different Form, and with very different Qualities.

And from hence it is evident, that no Medicine paſſing the Stomach, can have any alterative Effect upon the Blood, as an Acid or an Alkali; and conſequently all the Talk of Acids and Alkali's acting directly and immediately as Alteratives upon the Blood, has been nothing but mere groundleſs Hypotheſis; ſince the contrary is now very well known, and ſufficiently eſtabliſhed in Fact.

PROPOSITION X.

To explain the Nature and Conſequences of Fermentation in general.

BY Fermentation, I here mean that Change or Tranſmutation in Liquors, undergoing a certain Degree of Heat, Rarefaction, and inteſtine Motion, by which they receive another Form, and acquire Qualities and Properties very different from what they had before.

THUS the Juice of Grapes, Apples, or Water, impregnated with Sugar, Honey, Malt, *&c.* by undergoing a certain Degree of Heat and inteſtine Motion, is converted into Wine, and acquires a ſtrong, inflammable, inebriating Oil or Spirit in the Fermentation; not one Drop of which could have been found in the Liquor before it had been thus generated: And this ſame vinous Liquor, by being put under another and different Degree of Heat, Rarefaction, and Motion, will be turned into Vinegar, and become a ſtrong ſtimulating Acid.

FRESH Vegetables thrown together in a Heap, to heat and ferment, loſe all their vegetable Qualities, and acquire Properties very near akin to thoſe of Fleſh and animal Subſtances; and Fleſh left to heat and ferment in the open Air, loſes its former ſweet and nutritive Qualities, and is converted into a fœtid, poiſonous, and cadaverous Putrefaction.

THE animal excreted Liquors, by undergoing different Degrees of Heat and inteſtine Motion, or Fermentation in the Ventricles of the Glands, acquire a great Variety of Forms and Properties vaſtly different from one another, and from the common Liquor, from which they are digeſted and prepared. And thus we ſee common Chyle, Lymph, or Serum, converted into Milk, Urine, Bile, Sweat, Saliva, *&c.*

I KNOW that this great Variety of Secretions, in ſuch different Forms, Qualities, and Properties, have been commonly aſcribed to ſimple Colature, or a Straining off th-

the Serum of the Blood thro' ſmall Tubes or Pipes of different Diameters: But nothing can be more weak or abſurd, than ſuch a Suppoſition as this; for any particular Secretion, as Milk, Urine, Bile, *&c.* is capable of paſſing or ſtraining off through any of the excretory Ducts in the whole Body, without altering its Form or Qualities. In a total Suppreſſion of Urine, by an Obſtruction of the Ureters, this Liquor will often make its way through the Pores of the Skin, and give the Sweats and perſpirable Matter a ſtrong urinous Taſte and Smell; ſo that no Body can doubt its paſſing theſe Strainers, and this without altering its Nature and Properties. And in like manner, when the biliary Ducts are obſtructed in a Jaundice, and the Bile cannot take its natural and uſual Courſe into the Inteſtines, it will paſs through any of the excretory Ducts, and mix itſelf with all the other Secretions, ſtill retaining its own proper Form and Qualities, which are not at all altered by any ſuch Colature.

INDEED, if any Colature or Method of Straining could be found out, that would turn Wort into Beer, Muſt into Wine or Vinegar, or common Water into Milk, Urine, Bile, *&c.* ſuch a Doctrine might be liſtened to, and deſerve ſome Regard. But though as great Changes and Tranſmutations as any of the foregoing may be ſeen every Day, as the Conſequence of Digeſtion and Fermentation, yet nothing like this could ever be obſerv'd from any ſort of Colature or Straining.

I KNOW that this Doctrine of animal Fermentations, and the different Kinds and Degrees of them, in the Ventricles of different Glands, has been abſolutely rejected, and very much exploded by ſome modern mechanical or immechanical Writers; particularly by *Bellini* and his Followers. But then it is certain, that even *Bellini* himſelf knew nothing of the true Laws of Motions, and had no Regard at all to the Chymiſtry of Nature.

PROPOSITION XI.

To explain the Mechaniſm and Proceſs of Nature in glandular Digeſtion, Secretion, and Nutrition.

IN order to this, it will be neceſſary in the firſt Place, to conſider and explain the natural Texture and Conſtitution of the Glands, and of all the Coats, Membranes, and Fibres of an animal Body, which are intended for Nouriſhment and Growth.

THE Glands are commonly diſtinguiſhed into Simple and Compound, or to ſpeak more technically, Conglobate, and Conglomerate: But as a conglomerate or compound Gland is nothing elſe but a Heap or Congeries of ſimple Glands adhering together, and wrapt up in a common Coat or Membrane, I ſhall content my ſelf with deſcribing the Structure and Confòrmation of a ſimple Gland.

IN every ſuch Gland therefore, there are five Things to be obſerv'd, *ſc.* Its Ventricle, its Coats or Membranes, and its conveying, ſecretory, and expurgative Veſſels.

THE Glands have the ſame Coats with the Stomach, Inteſtines, and moſt other vaſcular Organs; but their muſcular Coats are proportionally very thick and ſtrong, like that of the Stomach, and to anſwer the ſame Purpoſes. The Ventricles of the Glands are much ſmaller, in Proportion to the Thickneſs of their Coats, than that of the Stomach; but when theſe Ventricles are fill'd, and obſtructed with a viſcid concretive Lymph, which cannot paſs, the Coats ſtill ſtretching, a very ſmall Gland may, by this Means, be ſwell'd and diſtended to a great Bulk, vaſtly beyond its natural Size: But where there is no ſuch preternatural

Tumour, the Ventricle of a Gland can hardly be diſcover'd when the Animal is dead; the muſcular Coat contracting itſelf ſo as to bring the oppoſite Sides of the Ventricle into a Contact, or very nearly; which makes the Glands under ſuch a Circumſtance, look like ſolid Bodies, or ſmall Kernels, from which they take their Name.

THE Ventricles of the Glands are ſupply'd by ſmall Lymphaticks, in the Direction of their Axes; every ſimple Gland having one or more ſuch, which continually feed it with the Matter to be there digeſted and prepared; and after the Digeſtion and Separation is perfected, the ſame conveying Lymphaticks continued, carry off the excreted Matter in the ſame, or very nearly the ſame Direction of the Axis.

THIS excreted Matter, thus ſeparated and extracted from the common Lymph or Serum, is ſometimes carry'd to the Emunctories, and thrown out immediately, as being of no farther Uſe; ſuch as the perſpirable Matter, Sweat, and Urine: Or elſe laid up in ſome Repoſitory, or convey'd into other Organs, to anſwer a farther Purpoſe, before it is ejected, as the Bile, pancreatick Juice, and Saliva.

But, in the mean while, the proper nutritive Lymph or Oil, from which this excretory Matter has been thus ſeparated and extracted, is carry'd off laterally to the nutritious Cells of the Parts and Organs, which are to be nouriſh'd and ſupply'd with it: And this Structure, Action, and Uſe of the Glands, is in every Reſpect exactly analogous, to what happens in the great and primary concoctive Gland of all.

But to underſtand the Buſineſs of Nutrition, it will be neceſſary to conſider the Structure and Formation of all thoſe Coats, Membranes, Teguments, Fibres, and ſolid Parts of the Body, which are intended for Growth and Nouriſhment.

In viewing the Solids with a Microſcope, we find them all, even to the minuteſt Fibre, either vaſcular or cellular; that is, the ſmalleſt Filaments are either concave all through in the Direction of their Axes, and are conſequently Tubuli or ſmall Pipes, intended for the Paſſage of ſome Liquor, in the Direction of their Concavity or Axis; or elſe they appear as porous or cellular Threads, conſtructed and formed of an Infinity of ſmall Veſicles, which cloſely adhere, but have no Communication with each other; and which cannot, therefore, admit of the Circulation or Paſſage of a Fluid along their Axes.

THOUGH this cellular Structure belongs to all the Solids, from the ſmalleſt Fibre to all the Tunicks, Membranes, and other ſolid Parts formed out of them; yet it is moſt ſenſible and remarkable in the adipoſe Membrane, the independent Cells or Veſicles of which are viſible to the naked Eye; and which, for this Reaſon, has been commonly called the Membrana Celluloſa: Not that ſuch a Structure is peculiar to this Membrane, ſince, as I have ſaid, by the help of a Microſcope it may be eaſily obſerved in any other.

NOW theſe Veſicles, as already deſcribed, I call the nutritious Cells, or alimentary Conſervatories. For here it is that the Lymphaticks, which are diſtributed to them, every way laterally depoſite a nutritious or alimentary, concreſcible or indurating Oil, which is afterwards fix'd and hardened into Fleſh, either fat or lean, according to the different Degrees of Heat and Motion, with which it had been concocted and prepared in the Glands.

THE nutritious conveying Pipes, or the Lymphaticks juſt now mentioned, having depoſited their nutritive Oil, carry off the thinner and more watery Parts, either to be afreſh digeſted in ſome other Glands, or to be thrown out of the Body. But here a Queſtion may ariſe, how the Oil in this Method of Conveyance ſhould be ſeparated from the Water, ſo as to be lodged in theſe Conſervatories, while the thinner Liquor or Serum flows on: And this I think happens thus; that when the oily Lymph is brought to the Mouths or Orifices of theſe oily Conſervatories, the animal Mucilage, or alimentary concreſcible Oil is ſtrongly attracted into theſe Conſervatories, while the Water is repell'd, or, which is the ſame thing, leſs attracted. And this is the Reaſon that Oil will not naturally mix with Water, though its ſpecifick Gravity may be the ſame, and that Water can never be impregnated with Sulphur even by boiling. And from hence we may ſee after what Manner the animal Oils are ſeparated from the Water, and from ſuch Earths and Salts, as ſtrongly and intimately mix and incorporate with Water; ſince a Water-Veſicle will always attract and imbibe Water till it is full, and an oily veſicle Oil.

PROPOSITION XII.

In all animal Motion, the original active Force is intrinſically in the Solids, and the Fluids only act as they are acted upon.

IF popular Opinion and Prejudice had not here determined the quite contrary, this Propoſition would be evident at firſt Sight; ſince 'tis certain in Fact that the Solids are indued with Elaſticity, as a conſtant uniform Spring or Power of Motion; whereas the Fluids have no ſuch Property or active Force at all: But ſo far as could ever be diſcover'd, are a mere dead *Moles* or Quantity of Matter, without any active Force but what is impreſs'd *ab extrà.* Nay, the Elaſticity or contractive Power of the Solids does not depend upon their being in the Body, or any Derivation of Fluids from the Brain, or elſewhere; but they retain the ſame Power and Property of contracting and reſtoring themſelves, againſt any ſtretching Force, when they are taken out of the Body; and conſequently, this is a Power or Property eſſential to and inherent in them, without any regard to, or abſolutely independent of the animal Fluids.

THAT the Contraction of the Solids in muſcular Motion cannot poſſibly be owing to the Influx of a Fluid from the Nerves, is farther evident from hence; that this being ſuppoſed, it muſt have a quite contrary Effect, and lengthen the Muſcle, inſtead of ſhortening it. For as all the Veſicles in an animal Body are diſtractile, as well as contractile, and capable of being diſtended in every Direction alike, 'tis manifeſt, that any Fluid thrown into them that is capable of diſtending them, by acting *undiquaque*, as all Fluids do, muſt equally increaſe their tranſverſe and conjugate Diameters; *i. e.* The Muſcle from ſuch a Cauſe would be extended in Length, and at the ſame time, increaſed in Thickneſs; which is contrary to the Hypotheſis.

BUT I ſhall only lay down one Argument more, which is abſolutely deciſive, and comes up to a ſtrict Demonſtration againſt the *Bellinian* Hypotheſis of muſcular Motion, by the Influx of animal Spirits, or any Fluid from the Nerves.

IN this Hypotheſis Men always argue in a Circle, and ſuppoſe two Things to be mutually and reciprocally the Cauſe of each other; and conſequently that they both ſubſiſt as Effects without any Cauſe or active

Force at all. For in this way, the Influx of the animal Spirits into the Heart contracting it, and driving on the Blood in the Courſe of its Circulation, is the Cauſe of the Contraction of the Heart, and the Secretion of animal Spirits in the Brain; and this Circulation again is the Cauſe of the Secretion of the animal Spirits in the Brain, their Influx into the Heart, and the Circulation of the Blood, as its neceſſary Conſequence: Which is only ſaying, that this Circulation is the Cauſe of itſelf, and that the Heart contracts and moves the Blood without any Cauſe at all.

BUT ſuppoſe this circulatory Motion to have been at firſt miraculouſly, and not mechanically begun, yet, I ſay, it could not poſſibly have been continued, when once commenced, by any of the known Laws of Nature, without a continued Miracle, or conſtant Interpoſition of divine Power, exerting it ſelf againſt all the known Laws of Motion and Mechaniſm. For the Circulation of the Blood, ſecreting the animal Spirits, and the Influx of the animal Spirits contracting the Heart, and circulating the Blood, cannot poſſibly be continued and carry'd on without ſome Reſiſtance, which Reſiſtance muſt be ſurmounted by ſome other Force acting conſtantly and uniformly through all the infinitely ſmall Portions of

Time, in which this Circulation is continued; or otherwiſe the circular Motion muſt ſtill diminiſh from the firſt Moment of its Commencement, till it is quite ſtopt. And hence the Mathematicians have ever declared from the ſtricteſt Demonſtration, any ſuch perpetual or continued, equal and circular Motion, by the Laws of Impulſe, to be impoſſible; or that ſuch a thing cannot be effected by any impulſive Communication of Motion.

WEIGHTS or Springs which act by their conſtant uniform Force of Gravity, or Elaſticity, are the only Cauſes of continuing Motion in a reſiſting Medium that we yet know of; and he who ſhould deny this, and pretend to continue Motion in circulating Fluids, and in a reſiſting Medium, by the bare Impulſe of one Part of ſuch a Fluid upon another, muſt at the ſame time contradict all the known Laws of Motion, and run himſelf into infinite Abſurdities. If any Man in his Senſes was to account for the Motion of a Clock or Watch, would he ſay, that the Weights or Spring is the Cauſe of the circular Motion of the Wheels, and at the ſame time the circular Motion of the Wheels the Cauſe of the Weight or Spring by which they are mov'd? And yet this is the true Mechaniſm of the *Bellinian* Philoſophers.

SCHOLIUM, I.

I SHOULD here have left this Propoſition as ſufficiently demonſtrated, had not ſo great a Man as Profeſſor *Boerhaave* lately attempted to ſupport the *Bellinian* Hypotheſis of muſcular Motion, without anſwering any of the Objections, which had been brought by me and others againſt it. I very much reſpect and honour this Gentleman, for his many Diſcoveries, and uſeful Advances in Chymiſtry, and the Application he has made of them in the Practice of Phyſick; and for which I think he muſt deſervedly hold the firſt Place, and ſtand at the Head of all the Chymical Philoſophers.

BUT where mechanical Principles and Facts are capable of mathematical Demonſtration *à priore*, he is not an equal Judge; and never meddles with ſuch Matters, without going out of his Province. Of which his Reaſonings upon the preſent Subject, will give the World a very convincing and ſignal Proof.

IN the fourth Edition of his *Inſtitutiones Medicæ*, which I have now by me, and which was publiſh'd in the Year 1727, he takes a vaſt deal of Pains to ſupport the

Bellinian Doctrine of muſcular Motion, by the Influx of animal Spirits from the Nerves; but to no other Purpoſe, that I can ſee, but to overthrow his own Hypotheſis, and prove himſelf miſtaken.

THE Profeſſor, in this Book, from *page* 114, N°. 236. to *page* 311, N°. 149. labours to prove theſe four Things. 1. That the cortical Part of the Brain is a Collection or Congeries of ſmall Glands. 2. That the *Medulla oblongata* and ſpinal Marrow, from whence the Nerves proceed, are a Continuation of the excretory Ducts of thoſe cortical Glands. 3. That the nervous Fibrillæ, which are contain'd in Bundles within their common and diſtinct peculiar Coats, are vaſcular, and deſign'd to propagate a certain inviſible and undiſcoverable Fluid, which cannot be exhibited by any poſſible Obſervation or Experiments to the Senſes, ſo as to prove in any ſuch way its real Exiſtence: And laſtly, that the Influx of this unknown unſearchable Fluid into the Muſcles, is the Cauſe of muſcular Motion.

AS to the two firſt of theſe, though much might be ſaid on both Sides, and ſome of the ableſt Anatomiſts have contradicted it, particularly *Ruiſch*, on whom this Author ſo much depends in other Matters; yet

I ſhall not diſpute it with the Profeſſor, ſince both may be granted him, or ſuppoſed for Argument ſake, without the leaſt Favour or Advantage to his main Hypotheſis.

BUT that the nervous Fibrillæ are vaſcular, and that they convey a Fluid to the Nerves, which is the Cauſe of muſcular Motion, is what I cannot conceive or believe, and muſt therefore take the Liberty to differ from him; and ſhall give ſome Reaſons to the contrary, after I have quoted his own Words in a very remarkable Paragraph, Page 140, N°. 289.

" AN igitur mirum tibi videtur, quod Humoris hujus Præſentiam & Motum, non aſſequatur Oculus? quod Ligaturæ, Vulnera, Puncturæ, Suctiones, Antlia Aeria, Injectio, non valeant Oculo eum exhibere? quod Cavitates Nervorum nulla Arte queant aciei viſus objici? Certè qui hæc eo Animo tentat, neſcit Naturam horum Vaſculorum, & Liquoris ipſius. Qui verò Oculum fugientes, & Artem eludentes, Cavitates Vaſculorum ideo negat; ignorat ſanè rationem Corporis noſtri in Origine, Progreſſu, Operationibus, Excretionibuſque, neſcitque Inſectorum fabricam. Non attendit denique ad ea, que Plantis manifeſtiſſimè accidunt."

Does it therefore ſeem ſtrange to you, that the Eye cannot trace the Preſence and Motion of this Humour? That Ligatures, Wounds, Punctures, Suctions, the Air-Pump, or Injection, can never make it ſenſible? And that the Cavities of the Nerves can by no Art be diſcovered to the ſharpeſt and moſt penetrating Sight? Certainly, he who ſhould expect this, knows nothing of the Nature of thoſe Veſſels, or of its contain'd Liquor. But he who ſhould deny the Cavities of the Veſſels, becauſe they eſcape his Eye, and elude all his Art, is ſurely ignorant of the original Nature and Conſtitution of the Body, in its Progreſs, Operations, and Excretions, and underſtands not the Fabrick of Inſects. Nor does he, laſtly, attend to thoſe Things which are moſt evidently true, with regard to Plants.

I MUST here obſerve in the firſt Place, that 'tis very unphiloſophical and immechanical, to ſuppoſe a thing as true in Fact, that cannot be prov'd, either *à priore*, or by any Obſervation or Experiment whatever; or to aſſume a Matter of Fact, that can neither be exhibited to the Sight, nor to any of the other Senſes. We believe the vaſcular Structure of the Lymphaticks, the Bones, and of the minute conveying Pipes in Trees and Plants, though their Cavities are not viſible even by all the Aſſiſtance of Glaſſes; becauſe they evidently receive and circulate a Liquor, which is ſenſible enough, and may be made the Object of the Sight, Touch, Taſte, and Smell. And for the ſame Reaſon it is evident, that the Nerves are vaſcular, as well as ſolid and cellular, ſince they receive and emit a Liquor that is ſufficiently ſenſible.

BUT the Queſtion here is, whether the nervous Fibrillæ are vaſcular, or only cellular, according to the Diſtinction laid down in the laſt Propoſition: For that the common and proper Coats, within which they are contain'd throughout all the Divſions and Subdiviſions of theſe Fibres in diſtinct Bundles; that theſe containing Coats, I ſay, are vaſcular, and that they receive and propagate a Fluid; which is of great Uſe, and very ſenſible, no Body can deny, this being a Matter of Fact and Experience. But we have all the Proof that can poſſibly be had from any Inſpection or microſcopick Obſervation, that the nervous Fibrillæ themſelves are only cellular and porous, as all Solids are, but not vaſcular or concave in the Direction of their Axes; and the contrary cannot be prov'd, as the Profeſſor owns, by any Experiments whatever.

But I muſt obſerve in the next Place, that as the Suppoſition of Veſſels would be abſurd and unphiloſophical without Proof, ſo is the Suppoſition of any Sort or Kind of Fluid, after the vaſcular Structure of the Organs has been granted. Let us ſuppoſe then, that the nervous Fibrillæ are vaſcular and concave, as the Profeſſor would fain have them; how does it follow from hence, that they receive, propagate, and emit any ſuch Fluid as he calls *Animal Spirits*; or a Fluid deſign'd for any ſuch Purpoſe as he would imploy it in?

Air and Light, as fine and ſubtle as they are, are yet very ſenſible in their Effects; and we could eaſily demonſtrate their Exiſtence, if any one ſhould deny it. The volatile æthereal Spirit or Oil of Vegetables, how much ſoever it may be ſubtiliz'd, and though its Quantity may be almoſt infinitely ſmall, yet it plainly and ſenſibly diſcovers its Preſence and Action, both to the Taſte and Smell; ſo that we cannot doubt of its Exiſtence, though we cannot make it viſible to the Eye, compute and weigh its ſpecifick Gravity, or make it ſubject to the groſſer Touch. But theſe animal Spirits elude all Art and Experiment, and will not ſtand the Teſt of any of the

Senſes; and are therefore, I think, infinitely above and beyond all Senſe and Reaſon.

BUT perhaps the Profeſſor will ſay, that though this wonderful Fluid is inſenſible in itſelf, yet it is very ſenſible in its Effects; and that we may plainly ſee and feel it in muſcular Motion: Which yet only amounts to this, that if you will not grant him ſuch a Fluid, he cannot account for muſcular Motion; and when you have granted or ſuppoſed this, he is as far from accounting for the Phænomenon as before. For, as I have prov'd, he can only aſſign the ſame circular Motion as its own Cauſe, and muſt ſuppoſe the Action of the Muſcles, upon his own Principles, to be an Effect without Cauſe.

SCHOLIUM, 2.

IT may perhaps ſeem ſtrange, but yet 'tis true, that the modern Diſcoveries of the Circulation of the Blood, and the Progreſs of thoſe Lacteals, or recipient Lymphaticks from the Stomach, which empty themſelves into the left ſubclavian Vein, have occaſioned, by a wrong Application and Uſe, more Errors in Phyſick, than the Ignorance of them have ever done among the Antients, while Anatomy was not ſo well underſtood; and while we have boaſted ourſelves of modern Diſcoveries, yet by a very bad Uſe of them, we have loſt the true practical Obſervations of the moſt antient Phyſicians, and their Method of curing Diſeaſes. Inſomuch that I dare boldly maintain, that a wrong Application of Mathematicks and Mechaniſm in Phyſick, has done more Miſchief than ever the Want of them did.

FROM the Circulation of the Blood, *Bellini* undertook to account for all the animal Secretions and Evacuations by mere Colature from the Arteries. And this he aſſign'd as the proper Office of the Glands, by their different Figures and Diameters, and by the different Velocities of the Blood at the Orifices of their ſecretory Ducts, to draw off Liquors of very different Properties and Qualities from the arterial Blood; ſuch as we obſerve in the various natural Secretions.

BUT he could never give an Inſtance in the whole Courſe of Nature, of any ſuch Changes and Tranſmutations made in Liquors, by any ſort of Straining, without Digeſtion, Concoction, and Fermentation. And as this is the only Method which Nature ever takes to any ſuch Purpoſe, ſo it ſeems to have been the principal Thing that he had a Quarrel againſt, and was reſolv'd ſolv'd to exclude. And in this he has had but too many Followers, who under a Pretence of Mechaniſm, and a clearer Knowledge of Anatomy, have ſubverted and deſtroy'd the whole Courſe and Order of animal Nature. But thoſe Gentlemen, if we did not certainly know the contrary, might as well tell us, that the Chyle in the Stomach, which is afterwards to paſs the Lacteals, and the Fæces which are thruſt out through the Inteſtines, had been drawn off from the Arteries, and that this wonderful Change had happened to them by ſuch a Colature. But we know ſo much of this Affair, that they cannot be ſo learned or ſo merry about it.

ANOTHER Principle which *Bellini* aſſumed and built upon was this, that the whole Quantity of Matter prepared and digeſted in the Stomach, was convey'd through the chyliferous Ducts into the ſublavian Vein, afterwards to be ſtrain'd off from the Arteries, before any other Parts of the Body could be ſupply'd or nouriſh'd. And conſequently, that all the Evacuations univerſally, as the Milk, the Urine, the Sweat, *&c.* and all the nutritious Matter of the Muſcles, Glands, Bones, Nerves, the Membrana Adipoſa, *&c.* muſt be ſupply'd from the arterial Blood. All which Suppoſitions are ſo highly monſtrous and abſurd,

ſurd, and ſo contrary to the moſt evident Proceſs and Operations of Nature, that the bare mentioning of them is ſufficient to expoſe and confute them.

IN the Philoſophical Principles of Medicine, *Part* II. *Prop.* 12. I have demonſtrated, that the urinary Evacuation, for Inſtance, does not follow the Laws of Circulation in the Blood; and the like will hold good in the other Secretions, that theſe may be increaſed, where the Velocity and Impetus of the Blood is diminiſh'd; and, *vice verſà*, as to the Urine, I have proved that a greater Quantity of it may, under certain Circumſtances, paſs through the Kidneys into the Bladder in a given Time, than the whole Quantity of Serum or ſecretive Matter paſſing thro' the Emulgents, in the ſame time: Nay, that if the whole Quantity of Blood paſſing through the Emulgents, was to be all drawn off by Urine, it could not ſupply any ſuch Quantity in the Time given.

EVERY Body that has made any Obſervations of the Matter, muſt be convinced, that the Blood-Veſſels often remain full and turgid, and diſcover no Diminution of Blood at all, after the Membrana adipoſa has been quite exhauſted, and the Perſon reduced to a mere Skeleton. And 'tis manifeſt, that the moſt extraordinary Diſcharges by Sweat, Urine, Stools, *&c.* do very little, or not at all leſſen the Quantity of Blood, as they muſt neceſſarily do, was this Matter to be deriv'd from the Blood, or ſupply'd by it. And from hence it is certainly true, that a bad Theory is worſe than none; and that Men had better act by mere Chance, than upon falſe Principles, and bare imaginary Hypotheſes.

THE Antients, as ignorant of Mathematicks, Mechaniſm, and Anatomy, as they were, yet they built their Practice upon ſuch Obſervations and Experience, as let them into the true Proceſs and Operation of Nature, in the Formation and Cure of Diſeaſes, where no Art had been uſed. And this Knowledge in Fact they were contented with, whether they underſtood the Reaſons of the particular Symptoms or not.

BUT finding that the Glands in Fact ſeparated a great Variety of Liquors of very different Qualities and Properties, from the common Maſs, they juſtly aſcrib'd this to different Kinds and Degrees of Digeſtion and Fermentation in the Ventricles of thoſe Glands, analogous to what they obſerv'd in the Stomach, and in the moſt obvious external Operations and Appearances of Nature. But the Moderns rejecting this Account,

count, have given no Account at all of the Matter; or rather an Account which has nothing at all to favour it in the Oeconomy of the Univerſe. The firſt Phyſicians and Philoſophers obſerving that the ſmall Parts of Bodies would either attract, intimately unite, and mix with each other, though of very different ſpecifick Gravities; while others would ſeparate from, and could never unite or mix, though their ſpecifick Gravities might be the ſame; and finding that the ſeveral Parts to be nouriſh'd, attracted and retain'd their own peculiar Aliment, while any other or different ſort of Matter was thrown off and driven on; they call'd this Power or Property, Sympathy and Antipathy, without knowing the real Cauſes of ſuch Effects, any more than we do of the Cauſe of Attraction, or of attracting and repelling Forces, which are ſo evident in Fact. Theſe therefore are but different Names for the ſame thing, or Terms to expreſs the ſenſible Appearances, or what we obſerve in Fact; and herein the Antients were as wiſe, and knew as much as we.

But the Truth is, the Moderns have in great meaſure loſt the Knowledge of Diſeaſes, and the Method of Cure, by a vain and fruitleſs Inquiry about their Cauſes; and inſtead of Reaſoning from the Symptoms or ſenſible Appearances to the original Diſeaſe; which is the only Cauſe that a Phyſician has to do with. They have choſen to begin at the wrong End, and having firſt pre-conceiv'd an Hypotheſis not grounded upon Experiment and Facts, they have attempted afterwards to accommodate both the Symptoms and Cure to ſuch Suppoſitions of Cauſes as have nothing but Imagination to ſupport them. And this of late, eſpecially ſince *Bellini*'s Time, has brought the Practice of Phyſick into greater Diſpute and Contempt than ever had been known before.

THE antient Phyſicians, eſpecially the Prince and Father of the Faculty, the divine *Hippocrates*, made Nature their Rule and Guide; and laid the whole Streſs of Cure upon regulating the Secretions. But our young Students in Phyſick are very little the better for reading this Author; at leaſt after they have well digeſted later Syſtems, and firmly grounded themſelves in modern Hypotheſes.

IN what *Hippocrates* has left us of the Hiſtory of Fevers, it might be thought that this great Maſter of the Profeſſion made no Uſe at all of Medicines, in theſe moſt popular and capital Caſes; unleſs perhaps, now and then Bleeding, or giving a Glyſter. And this makes it a very heartleſs Thing, for a Student of Phyſick in the modern Way, to read an Author, however celebrated, where he can meet with no Preſcriptions, no ſpecifick Remedies, and no Talk at all about Ætiology.

But the Deſign of this great Maſter of the Faculty, was certainly to make Phyſicians, and not Empyricks and prating Pretenders: And therefore he collects and exhibits to us ſuch hiſtorical Caſes in which Nature had cured, as well as formed the Fever, without the Aſſiſtance of Art, unleſs here and there, under ſome great Exigence, where the Artiſt interpoſed juſt to ſave Life; and then he takes Care to give Notice of it. But generally the whole Proceſs, both in the Formation and Cure of the Diſeaſe, ſeems to have been left to Nature, to let us ſee from what Cauſes and Occaſions ſuch Symptoms had been brought on, and by what Evacuations they had been thrown off; and thereby to inform us what we ought to do under the like Circumſtances, and what Evacuations are to be promoted, in order to relieve and help Nature where ſhe cannot gain her Intention; and thereby to procure a Criſis by Art, in a ſhorter, ſafer, and more effectual Way. And this nice and careful Regard to the Method and Proceſs of Nature, in the Formation and Cure of

Diſeaſes, is a Matter of ſuch infinite Importance, that all rational Practice, and the whole Buſineſs, Skill, and Succeſs of a Phyſician, muſt depend upon it.

BUT inſtead of following this Method, and taking all our Meaſures from what we ſee Nature itſelf effect in the Cure of Diſeaſes, our modern Books of Phyſick are generally ſtuff'd with moſt unintelligible Jargon, from the mere imaginary Principles of a corpuſcularian Philoſophy, of which the Authors knew no more than they do of the Inhabitants of the Moon, or the Diſeaſes there prevailing.

THUS with ſuch Authors, we find the Cauſes of Fevers deduced from an Ignefaction or Accenſion of the Archæus; from an Incendium or Conflagration of Sulphur and Nitre, from a perturbated Mixture of the Blood and Orgaſm of the Spirit, from the Acrimony of the pancreatick Juice, from the Corruption of the bilirſe Salt, from a certain deletorious Miaſm, which contaminates and ſuffocates the animal Spirits; from the Expanſion and Exploſion of the Spirits, both animal and vital; with a great deal more of this Sort, of which I muſt freely own that I do not underſtand one Word. Nay, even the great and honeſt *Sydenham*, a Man generally ſparing enough of Hypotheſes in Phyſick, cannot ſometimes help falling into this Way; and when he does ſo, is ſure to talk unintelligibly. 'Tis hard to know what he meant by his malignant Aura, his Deſpumation of Humours, his Commotion of the Blood, from a certain heterogeneous Matter; his ſpecifick Exaltation of Juices; all which, perhaps, he might not underſtand himſelf.

I SHOULD not envy theſe Gentlemen their Improvement in Phyſick, if they would confine them to the Cauſes of Diſeaſes only; but they generally carry the ſame Darkneſs and Confuſion to the curative Intentions too. And when you come to adviſe with them, by what Means a Fever is to be taken off, you can no more underſtand their ſpecifick Method of Cure, than their corpuſcularian Account of the Cauſes. Diaphoretick Antimony, mineral Bezoar, the Æthiops, Cinnabar, the terreſtrial Boles and Teſtacea, and in ſhort, every Thing that is indigeſtible, and indiſſoluble, muſt be convey'd thro' the Lacteals into the Blood, with a Commiſſion to every Particle of the Medicine to attack every Particle of the morbid Matter, and never to quit the Enemy till a complete Victory is obtain'd. But if you would talk with them about Evacuations, as whether you are to bleed, purge, vomit, ſweat, *&c.*

to what Degree theſe are to be indulged, how directed, and when to be ſtopt; theſe are poor mean Conſiderations, much below their ſuperior Genius; and they are too well acquainted with the Power of their own Specificks, than to liſten to your Doctrine of Evacuations. *Sed pudet hæc opprobria nobis.*

PROPOSITION XIII.

To explain the Nature and Uſe of Sudorificks, or the Method of curing Fevers by Sweating.

ON the Attack of a Fever, we find the natural Evacuations in general greatly obſtructed and diminiſh'd. The Skin is dry, rough, and ſtarky, with little or no Perſpiration or Sweat. The Urine is diſcharged but in ſmall Quantities, of a high Colour, and thin or uniform, without any Sediment. The Stools are commonly hard, glutinous, and very fœtid; and the Glands of the Mouth and Throat parch'd and dry, for want of diſcharging their proper Liquors, with a white or browniſh Cruſt, like a Pellicle, about the Tongue.

Now this being the general State of the Secretions in Fevers, without medling with the unintelligible Principles of the ſpecifick and corpuſcularian Philoſophy, the only true and natural Indication and Intention of Cure, is to recover and reſtore, as ſoon as poſſible, the obſtructed and diminiſhed Evacuations; and the ſooner this is done, it will be in all Reſpects the better, and leſs hazardous.

Doctor *Sydenham*, who generally declaim'd ſufficiently againſt all Hypotheſes in Phyſick, had herein a bad one of his own. He talks of I know not what ſort of Fermentation and gradual Diſpumation in this Caſe, by which the morbid Matter muſt require a certain given Time to be ſeparated, concocted, and prepared, before it could be fit for Expulſion and Elimination by the Emunctories. But herein he was certainly miſtaken, and led aſide by the Prejudice and Prepoſſeſſion of an Hypotheſis, without the leaſt Ground either in Reaſon or Fact.

If a Fever always ariſes from a general Obſtruction and Diminution of the natural Evacuations, or if this be at leaſt the State of the Secretions in a Fever, and the natural Conſequence of it, who would retain the obſtructed Matter one Moment beyond what was abſolutely neceſſary to reſtore them into their natural Courſe? Since it is certain, that the longer the obſtructed Matter remains in the Body, the more it muſt corrupt, putrify, and run into preternatural Fermentations. And nothing can be more certain or evident than this, to all Experience, that the ſooner a Fever is brought to a Criſis, by reſtoring the obſtructed and diminiſh'd Evacuations, whether it is done by Nature or Art, the ſhorter and more effectual is the Cure, and the leſs liable to after ill Conſequences.

IF a natural Sweat happens to break out at firſt, or a plentiful Diſcharge by Urine, the Fever is preſently terminated and carry'd off, as I have obſerv'd in numerous Inſtances; and it is indeed a Matter of common Obſervation and Experience.

HIPPOCRATES in his hiſtorical Caſes, obſerves, that a Fever was preſently reſolv'd and terminated at any time of the Diſeaſe, by the breaking out of Sweats, or a natural and occaſional Profluvium of Urine. And this is Ground enough for a Phyſician, to direct him what Method to take in aſſiſting Nature, in order to recover theſe Evacuations, where the Criſis is kept off, and cannot be naturally brought on, without Loſs of Time, and thereby expoſing the Patient to Danger; which is always the Caſe. As to the procuring a free Diſcharge of Urine in Fevers, as Occaſion ſerves, and when we pleaſe, I doubt it is not practicable; or at leaſt I could never ſucceed in it, with any Certainty and Security. There is no Evacuation in Nature that we are leſs Maſter of than this.

But Sweats, by a right Management, may be procured at any time; and there is no Evacuation that can be obtain'd with leſs Difficulty, or more Safety. And the Method of doing this to the beſt Advantage in Fevers, I am now to conſider.

There is no Part of the *Materia Medica* better underſtood, than the Uſe of Sudorificks; and there is ſcarce any Man but occaſionally ſweats himſelf. But the Management and Direction of this Operation in Fevers, will require a more particular Explication.

When therefore a Man is at firſt ſeiz'd with a Fever, if he has no Phyſician at hand to direct him, he ought immediately to go to Bed, and put himſelf into a Sweat as ſoon as he can: Which Sweat is to be ſupported and ſupply'd by plentiful diluting, or drinking freely, and in large Quantities, of Sage and Organy Tea, Water-

Gruel, Barley-Water, or Milk and Water warm, thin Broths, Rheniſh or Syder, Whey, *&c.* And this Sweating thus raiſed, is not to be kept up only for a few Hours, and then left to ſink and go off again; but to be maintain'd and continued in a moderate uniform Degree, till the Fever is off, and the Symptoms vaniſh and diſappear.

THIS Method generally carries off any Fever in about twenty four Hours, when thus taken at firſt, or before it has fix'd and form'd itſelf. It will be ſufficient almoſt in any Caſe, when a Fever is thus taken at firſt Invaſion, to take a quarter of an Ounce of Venice Treacle at going to Bed, and then immediately following it with the diluting Liquors as above. But if the Sweats, notwithſtanding this, ſhould be apt to dip in before the Fever is terminated, it will be enough to drink now and then a large Glaſs of ſmall hot Punch, impregnated with Spices, eſpecially Ginger and Cloves; and then go on with diluting as before.

BUT where the Fever has been once throughly fix'd and form'd, and the Help of a Phyſician become neceſſary, the Matter is not ſo eaſily managed, but Difficulties will often ariſe, which muſt require a farther Conſideration.

In raiſing and maintaining theſe Sweats, a principal Regard ought to be had to the Nature and Kind of the Fever, as effluent or influent; or according to the common Diſtinction and Way of ſpeaking, inflammatory or nervous.

Inflammatory or effluent Fevers, as all know, require a cooler Regimen, and lower Liquors; and as the common Drinks in this Caſe ought to be low and cooling, ſo to make them the more ſo, it is generally convenient to acidulate them with Juice of Lemons, Spirits of Sulphur, Vitriol, Nitre, *&c.* And beſides this, where there is a ſanguinary Plethora, or redundant Quantity of Blood, which not ſeldom happens in ſuch Caſes, Bleeding will be neceſſary at firſt, and Glyſters repeated on Occaſion, in caſe of any great Coſtiveneſs, or Conſtipation of the Bowels. And with theſe Precautions the Sweats will commonly riſe, and ſucceed very well, till the Fever is ſafely and critically diſcharged and carried off.

But in Influents, or, as they are call'd, ſlow and nervous Fevers, the Method of raiſing and continuing the Sweats to the Solution of a Fever muſt be different. For here a much warmer Regimen will be neceſſary, and the common Drinks or diluting Liquors ought to be raiſed higher, ſo as to indulge the Patient in the free Uſe of white Wine Whey, Water, with a third or fourth Part Wine, Water-Gruel, Barley-Water, or Pippen Liquor, with White Wine, *&c.* But beſides, ſome warm ſudorifick Medicine will be generally neceſſary to raiſe and maintain the Sweats, thro' the Courſe of the Diſeaſe, and till the Criſis is perfected. And here nothing contributes more effectually to promote this cuticular Diſcharge, than Opiates prudently adminiſter'd, to which Purpoſe I commonly uſe and prefer the following Laudanum.

IN a Pint of the Tincture of Saffron, made upon Spirit of Wine, digeſt and diſſolve an Ounce of the beſt Opium: Which Digeſtion and Solution being finiſh'd and ſtrain'd off, add three Ounces of Camphire, to be intimately mix'd and incorporated with the opiated Tincture. This may be given from 20 to 60 Drops, or a common Tea ſpoonful, and repeated as Occaſion ſerves, or as the Phyſician ſhall ſee fit. And 'tis here very remarkable, that Opiates thus uſed are ſo far from doing any Prejudice in thoſe comatoſe Stupors and Deliriums, which are ſo common in theſe Fevers, that on the contrary, thoſe Symptoms are very much reliev'd by it; in conſequence of their raiſing the Pulſe, diffuſing the natural Heat, and throwing out the critical Sweats. And by this Means alſo, the cold Sweats, Deliquiums, Convulſions, and Twitchings of the Nerves, ſo incident to ſuch Fevers, are reliev'd, and preſently vaniſh, in Proportion to the warm critical Sweats. But as ſoon as ever the Sweats happen to dip in, during the State of the Fever, the foregoing Symptoms preſently return, and are as ſoon reliev'd by recovering the Sweats as before. And this ſhews the great Conſequence of ſtill maintaining and keeping up theſe Sweats in a moderate Way, during the whole Courſe of the Fever, till a Criſis can be obtain'd; which is ever in a longer or ſhorter time as the Sweat is kept up, in a conſtant, uniform, and moderate Flow, or ſuffer'd to ſink and retire at every Turn, and for conſiderable Intervals. And therefore, as a Phyſician cannot be always ready and in waiting, the Nurſes or Friends who are about the Sick, and giving conſtant Attendance, ought to be led into the Nature and Intention of the Medicines; and directed how, and in what Circumſtances to give them. For 'tis impoſſible to fix any ſtated canonical Times or Intervals for giving of Medicines of Efficacy, and which are to take Effect to a certain Degree, and no farther. For in this way a Sudorifick would be ſometimes given when the Sweat was too high before, and ought rather to have been mitigated; and at other Times the Medicine would be neglected, to the great Hazard of the Patient, when it was highly neceſſary to have been given, and this only to wait for the ſtated Times, which the Phyſician perhaps had fix'd, ſo as not to be altered before he could poſſibly know what would happen. But this in the preſent Caſe, and in moſt others would be ordering and directing Medicines at Random, and without any Judgment or Diſcretion. But ſuch a Method cannot be accounted for, without ſuppoſing the Phyſician himſelf to be in the Dark, as to the Nature, Effects, and Operations of his own Medicines, or what he had to expect from them.

A SPECIFICK Doctor indeed might expect the Cure of the Diſeaſe in ſome ſecret occult Way, without knowing how or why; but that Patient muſt have a ſtrong Faith, who would truſt his Life in ſuch Hands.

BUT to proceed, it often happens in theſe influent Fevers, eſpecially where a Phyſician is call'd in late, that the foregoing Method will not take Effect without Bliſtering: And though this is too commonly made the laſt Reſort, yet it would be always beſt and ſafeſt to apply the Epiſpaſticks at firſt, or as ſoon as poſſible, where there is any great Appearance of Danger.

From this Defect or Negligence, I am very ſure that many Lives are continually loſt, which might otherwiſe be ſaved: And I never yet met with any Phyſician, who repented of bliſtering too ſoon, but with many who have lamented the Loſs of Patients for want of it. But the Uſe and Application of Bliſters, is a Matter of ſuch infinite Conſequence, eſpecially in the worſt Sort of Fevers, that it will here deſerve a more particular Conſideration.

ONE vaſt Advantage of Epiſpaſticks duly apply'd, is this, that hereby we can make the largeſt and moſt uſeful Derivation of peccant Matter, from the Parts moſt directly and immediately affected, when we cannot reach or draw it off by any other Method.

WHEN an immoderate Quantity of viſcid glutinous Humours have been driven to the Head, and fixed upon the Brain, occaſioning Phrenſies, or comatoſe Stupors; a large ſtrong Epiſpaſtick apply'd to the Head cloſe ſhav'd, by diſcharging a vaſt Quantity of Matter, relieves theſe terrible Symptoms, and reſtores the Perſon to his Underſtanding and ſound Senſes within twenty-four Hours. And after the ſame manner, a like Plaiſter in a Pleuriſy, apply'd to the Side, upon the Part where the Pain is chiefly ſeated, takes off the Pain and Fever without any other Method, and with equal Speed and Certainty. Nor have I ever known theſe Effects fail, where the Patients were not as good as dying, or paſt all Hope, before ſuch Application. And the Caſe is the ſame in a Quincy, Peripneumony, and where-ever any particular organical Parts are inflam'd, tumify'd, and in danger of Mortification, by a large Afflux of Humours.

BUT in all theſe Caſes, as the Epiſpaſticks ought to be large and ſtrong, ſo ought they to be apply'd, as near as poſſible, to the Parts affected, or where the Humours are chiefly lodged; for otherwiſe they will not have the ſame Effects. And thus Bliſtering the Head will not cure a Pleuriſy, nor will Bliſtering the Back, Sides, Arms, or Legs, take off a Phrenſy, Lethargy, or comatoſe ſoporiferous Stupor.

BUT another vaſt Advantage of this Method is, that Bliſters are found by Experience, to act as the moſt certain and effectual Sudorificks. Where all other Means fail, the Caſe be not abſolutely deſperate, effectual Bliſtering will bring on and maintain the critical Sweats, by which a Solution of the Fever muſt be effected. And tho' this perhaps may not be commonly taken notice of, yet

I have ever found it true in Fact, by the moſt conſtant and certain Obſervations.

Now I am upon this Subject, it may be worth while juſt to take notice of the common Method of dreſſing Bliſters. As to which, they who give themſelves the Trouble of it might ſpare their Pains, to the great Eaſe and Advantage of the Sick. Nothing is hereby gain'd, but the plaguing and tormenting the Patient, and depriving him of the Benefit of a much greater Diſcharge; which would be at leaſt three to one, were the ſame Plaiſter left on for four or five Days, or as long as it will draw off any thing. And then when it has done running, it will be ſufficient to take it off; and apply a Plaiſter of Mellilot, or rather of Diaculum, once for all, till the Part is quite well and healed.

When a Bliſter indeed is firſt riſen, if it does not break and run of itſelf, it may be proper to raiſe the lower Part of the Plaiſter a little, to ſnip the Bladder, and let out the Water; but if the Surgeon has made the Plaiſter ſtrong enough, this is commonly done of itſelf, and without Help.

No doubt but this Method will be objected to, as every thing elſe of any great Uſe or Advantage commonly is, by ſuch as argue only from pre-conceiv'd Hypotheſes, without Facts or Experience to ſupport them. I have often heard it objected, that a ſtrong Epiſpaſtick left on for five or ſix Days, muſt deeply corrode the Fleſh under it, and thereby endanger a Mortification. But this is ſo far from being true, that on the contrary, it certainly prevents the worſt Accidents that I have ever ſeen in Bliſtering.

WE never find any thing worſe, or more troubleſome, happen in bliſtering, than what they call a *Slough*, or a deep ſtrong Incruſtation of a very ſharp Salt and adheſive Matter, covering the whole Surface of the Fleſh, where the Plaiſter had been apply'd. Now this is always occaſioned by an unſeaſonable Removal of the Epiſpaſtick, while the Humour is in full Flow, and ſtrongly feeding to the Part; and the Humour thus ſuddenly check'd and thrown back, for want of a ſufficient Drain, forms this Slough. And how exceedingly painful this ſometimes is, and difficult to remove, the Surgeons, and all ſuch as have been concern'd about it, very well know.

BUT if Bliſters ſuffer'd to lie on for five or ſix Days without dreſſing, be of ſuch dangerous Conſequence, why do we never find it in bliſtering the Head, where they are never dreſs'd at all, but continue running, and making a plentiful Diſcharge ſometimes for ten Days or a Fortnight together.

THIS Solution of Fevers by critical Sweats, is the only true original and genuine Work of Nature; and no other Method is ever taken naturally or originally, but where Nature has been ſome way or other fruſtrated and defeated in this firſt and main Intention. And this Obſervation will hold good, and is ſufficiently confirm'd, by Experience, in all Fevers, univerſally from the Loweſt and Mildeſt, to the Higheſt and moſt Malignant; or from an Intermittent to the Plague.

IF the Paroxyſms of an Intermittent, eſpecially of a Quartan, do not go off with plentiful Sweats, the Fits will ſtill return, and the Ague will very often run into continual influent or low Fevers, Conſumptions, Aſthmas, Dropſies, *&c.* notwithſtanding any Uſe of the Bark. And not only Quartans, but even Tertians, eſpecially for ſeveral Years paſt, have been very apt thus to degenerate into greater and worſe Diſorders, their Paroxyſms not going off as formerly in plentiful Sweats. And therefore when I had obſerv'd this for ſeven or eight Years ago, I almoſt ſet aſide the Uſe of the Bark in Intermittents, and bethought

thought myſelf of another Method, which has prov'd much more ſucceſsful.

ABOUT an Hour before the Invaſion of the cold Fit, I give a Vomit, which being wrought off, I immediately order the Patient to Bed, and, as ſoon as poſſible, put him into a large and copious Sweat, to be continued and ſuccour'd by plentiful Dilution, for ſix or eight Hours. This Method three or four times repeated, ſcarce ever fails of curing a Quartan, eſpecially if the Perſon affected uſe the Cold Bath every Day between the Fits. But in a Tertian, once or twice repeating is commonly enough.

INDEED I have known ſeveral Inſtances, in which the *Cold Bath* alone, by going into it during the ſhaking Fit, and then going preſently to Bed, a profuſe Sweat riſing thereupon, has cured a Quartan at once, after it had been of long ſtanding, and the Bark had been uſed to no Purpoſe. But I have not had Trial enough of this, to affirm that it will always ſucceed.

IN petechial and malignant Fevers, there is no other Hope but from Sweating; and if this Intention be not obtain'd either by Nature or Art, the Diſeaſe infallibly kills, and the Specificians, whatever they may promiſe, can do nothing.

AND in this Caſe 'tis impoſſible to raiſe and maintain the Sweats uniformly and æquably, without the moſt powerful and effectual Bliſtering. And here the Epiſpaſticks muſt be very large, ſpread thick, and made as ſtrong as poſſible, and then apply'd to the Head, Back, Sides, or Thighs, as the different Symptoms and State of the Fever may require; when at the ſame time ſmall Bliſters apply'd to the Legs, Arms, Wriſts, *&c.* as is too common, would be only trifling in ſuch Caſes, and throwing away Life for want of giving Nature the proper and neceſſary Aſſiſtance. The cold clammy Sweats, the comatoſe Stupors, the Spaſms of the Stomach and Lungs, and convulſive Twitchings of the Nerves in general, which are only the weak and ineffectual Efforts and Struggles of Nature to gain a Point, which under ſuch an Oppreſſion cannot be obtain'd, are all plain and neceſſary Indications of the Method here propoſed.

AND 'tis evident in Fact, to all that have ever made the Trial, that as ſoon as ever the warm critical Sweats are obtain'd, the cold convulſive Sweats, and all the foregoing Symptoms vaniſh, and ſtay off as long as thoſe warm critical Sweats are kept up in an uniform and due Degree. But as ſoon as theſe warm, foul, and critical Sweats ſink or dip in, whether from Accident, or Want of Care, which laſt is the common Caſe, the ſame Symptoms preſently return, and continue till the critical Sweats are recover'd and brought out. And this is ſo true and general a Rule, that I have never known ſo much as one Exception to it.

'TIS true indeed, that thoſe Symptoms upon the Check of Sweating do not always return in an equal Degree, but in Proportion to the Intervals of the critical Sweats, be they longer or ſhorter. And this ſhews the Neceſſity, or at leaſt Expediency of keeping them up in a moderate, uniform, and equal Degree, ſo far as poſſible, till the Symptoms vaniſh. And in this Caſe the Sudorificks that may be neceſſary, beſides the common Drinks and diluting Liquors, ought to be exhibited in a State of Fluidity. For 'tis a moſt unreaſonable Impoſition on Nature, (and in which a Dog, were he able, would ſpeak for himſelf) to be continually forcing and urging a Stomach with *Solid Medicines*, which cannot receive, retain, or digeſt any thing of *Solid Food*. And this could never have been done or continued in, had it not been for the prevailing Notion of ſpecifick Remedies. But the Patient muſt bear any thing when his Diſeaſe is to be cured by Magick, and when his Phyſician inſtead of any other good Quality, is only a very good Conjurer.

But as it is a Matter of the utmoſt Conſequence, I ſhall farther exemplify this Method in the Cure of the Small Pox; which Diſeaſe, as the Caſe now ſtands, carries off about a ſixth Part of Mankind. I ſhall not here ſtay to enumerate all the particular Symptoms of this Malady, under its various Forms, Sorts, and Appearances; which may be found in moſt practical Writers, and are deſcribed moſt accurately by Dr. *Sydenham*, the modern Oracle in this Diſeaſe.

It muſt be own'd, that the laſt mentioned Author has given the moſt particular, exact, and faithful Account of the Symptoms in the Small Pox, of any other; and in this he ſucceeded the better, as he was not prejudiced and tied down to any Hypotheſis in Phyſick. He was not prepoſſeſſed and preingaged with the abſurd and unintelligible Principles of the corpuſcularian or ſpecifick Philoſophy, and therefore had nothing elſe to do, but to give a plain and honeſt Account of Facts, as he obſerv'd them. But with regard to his Practice, it may be doubted whether he did not carry his cooling Regimen a little too far, or at leaſt the ſame Method will not always ſucceed now.

BUT to paſs over whatever may have been ſaid by others in the Courſe of this Diſeaſe, I ſhall here only inſiſt upon the plain and indiſputable Method of Nature, in forming and curing the Small Pox, where Phyſicians have not been call'd in. For I think no Phyſician can proceed rationally in curing any Diſeaſe, till he knows how Nature, when not oppreſs'd and overborn, uſes to cure it without him. And he who does not take this Method, and make this the principal Ground of his Practice, ought not to read *Hippocrates*, and can never be the better for reading any thing elſe in Phyſick. Such a Practitioner may indeed talk learnedly, but will never act judiciouſly.

BUT to proceed, the variolous Fever under its proper Types and Symptoms, makes its Attack within twenty four Days after the Perſon affected had taken the Infection, commonly within fourteen Days, but ſometimes within ſeven, or even two or three Days. Nay, there are ſome Inſtances of the Attack of the Fever almoſt preſently, or within twenty four Hours of the Infection taken. But it may be depended on, as a certain general Rule, that the longer the Interval is between the Infection receiv'd, and the Appearance of the Fever, the ſlighter will the Fever be, and the more mild, diſtinct, and favourable the ſucceeding Puſtles. And this Interval between the Infection receiv'd, and the Appearance of the Fever, depends on the Temper and Diſpoſition of the Blood at the time of Infection, and on ſome Incidents which may happen during that Interval; and it may be proper to explain this a little before I proceed farther, becauſe the ſucceeding Formation and Proceſs of the Diſeaſe will be in great meaſure govern'd and directed by it.

THE State and Diſpoſition then of the natural Evacuations, in the Interval between the Infection receiv'd, and the Invaſion of the Fever, ought to be conſider'd and regarded as a Matter of the higheſt Importance in this Diſeaſe.

WHEN at taking, the Infection, or at any time between that and the Attack of the Fever, any of the natural Evacuations by Perſpiration, Sweat, Urine or Stools, had been occaſionally obſtructed, by taking Cold, in a moiſt foul Air, expoſing ſome particular Part of the Body to the cold Air, while the other Parts are warm, a ſudden Check of Sweats, over heating and inflaming the Blood by Drinking, violent Exerciſe, &c. I ſay, when any thing of this happens to obſtruct all or any of the Evacuations here mentioned, the ſucceeding Fever will be haſtened on and riſe very high, the Symptoms will be ſevere, and the Event doubtful. It highly concerns therefore every Perſon who has not had the Small Pox, and who yet is obliged to live in a contaminated Air, and where the Diſtemper is rife, eſpecially when an actual Infection may be ſuſpected, to watch carefully theſe Evacuations, and to remove any ſuch Obſtructions immediately, and before the Invaſion of the variolous Fever. For when this Fever comes on upon ſuch Cauſes and Occaſions, as might have raiſed a Fever of another Sort at any time, though no ſuch Infection had been taken, any one may gueſs what the Conſequence muſt be, and how hazardous the variolous Fever will prove: And therefore upon any ſuch Incidents, which might threaten a Fever, without any Infection from the Small Pox, the ſafeſt and moſt effectual Way is to cleanſe the Stomach and Inteſtines, by an Emetick or Cathartick, in caſe of any Foulneſs of the one, or Obſtruction and Conſtriction of the other. And then to go to Bed and take a Sweat without any Loſs of Time, in order to open the excretory Ducts of the

Skin, and reſtore that neceſſary and moſt important Evacuation.

When this is done in time, all the ſucceeding Danger is prevented, and the Puſtles generally iſſue well, though they may be of the confluent Kind, and the Infection taken from the worſt Sort. And this I take to be the vaſt Advantage of our new Method of Inoculation, where due Care may be taken to regulate the natural Evacuations, and to ſettle them in their due Quantities and Proportions, before the Diſtemper is brought on; and this for the moſt Part prevents all farther Danger.

If a Perſon being once infected with the Small Pox, flies into a freſh untainted Air, and there breeds the Diſeaſe, it always fares worſe with him, than if he had ſtaid in the ſame Air where he had taken the Infection. I muſt own, that I know not well how to account for this, and therefore I only give it as a Matter of Obſervation and Experience, which others may take notice of, and account for as well as they can. Perhaps a freſh untainted Air may not ſo ſtrongly attract and draw off the virulent Effluvia in this Diſeaſe, as an Air already impregnated with them. But however that be, I am very well ſatisfied from a great many Obſervations and Inſtances, that the Matter of Fact is true.

WHEN a Perſon is ſeiz'd with the Small Pox, of the diſtinct, mild, and favourable Sort, he is very much diſpoſed to ſweat all along, though he lies with no more Covering than at other times, refrigerates himſelf with freſh Air, and uſes a cooling Regimen in Diet. And while theſe natural Sweats are continued through the whole Courſe of the Diſeaſe, the Stools ſucceed as uſual, without any thing of a Coſtiveneſs or Conſtriction of the Bowels, and the Urines, not much heated and inflam'd, are made very nearly in their natural Quantity ; eſpecially after the Eruption from the third or fourth Day. Now where Nature thus ſucceeds, and does the whole Work without the Aſſiſtance of Art, the Fever either goes quite off, or is exceedingly abated, as ſoon as the Puſtles are out, and the Diſeaſe is commonly terminated on the eighth Day.

BUT where the natural Evacuations had been obſtructed from any of the foregoing Cauſes, and the natural Sweats do not ſucceed, as above deſcribed ; though the Puſtles may be diſtinct, and of the beſt Sort, yet the Fever if left to Nature, under theſe Circumſtances will riſe very high, and the

Diſeaſe often proves extremely dangerous, and ſometimes mortal.

But in the confluent Pox, though it may come on without any preceding Obſtructions, the Fever riſes much higher, and all the Symptoms are more ſevere. The Patient does not ſweat from the Beginning, as in the other Sort, but is much inclined to a Coſtiveneſs or Conſtriction of the Bowels, though he had no ſuch thing before. He is hot, reſtleſs, and in great Anxiety for the firſt four or five Days, till the Eruption is in great meaſure perfected; but about the fifth Day, if Things naturally ſucceed well, the Sweats break out and continue throughout the whole remaining Period of the Diſeaſe, by which the Fever is exceedingly abated, a Delirium prevented, the natural Maturation of the Puſtles promoted, and a ſafe Criſis obtain'd. But in caſe theſe Sweats do not appear, but the Skin continues dry, the Fever ſtill rages, a Delirium enſues, and Nature is under the utmoſt Confuſion and Oppreſſion; and if not reliev'd, every thing ſtill grows worſe and worſe, the Fever riſes higher and higher, the Puſtles inflame and mortify, inſtead of a natural Growth and Maturation; the Swelling of the Face ſinks, the Spitting ſtops, and in fine, the Patient dies convulſed,

ſed, and ſuffocated with the virulent, rarefy'd, and inflam'd Matter, which can find no Vent.

IN grown People labouring under the confluent Pox, the Eruption is commonly ſucceeded with a pretty free and plentiful Spitting; and this Diſcharge has been thought of ſuch Conſequence, that its not coming on kindly at firſt, or afterwards ſtopping unſeaſonably, and before the due Time, have been reckoned among the worſt Symptoms, and almoſt a certain Prognoſtick of Death.

AND yet 'tis certain, that in young Children the Defect of this Sputation is ſupply'd, or rather its Neceſſity prevented by a Looſeneſs, which continues for much the ſame Interval, and under the ſame State of the Diſeaſe with the others, and ſucceeds with more Certainty and Safety. Which affords us a moſt evident and ſenſible Proof that the Evacuation by Stools is not ſo inimical in this Diſeaſe, as ſome have fancy'd, and that while it is kept within its due Bounds, and Nature not ſuffer'd to overact her Part in it, it is ſo far from hindering the regular Riſe, Growth, and Maturation of the Puſtles, that on the contrary, thoſe neceſſary Operations are aſſiſted, promoted, and ſecured by it. And indeed, nothing can be more irrational or abſurd, than to prevent a natural Evacuation in this Caſe, which is found ſo neceſſary in the Cure of all other Fevers. But would any Man, with his Wits about him, conſtringe the Bowels, and lock up the Stools, with a Deſign to promote Perſpiration and Sweat, when ſuch a Method by keeping back the Urines, and inflaming the Blood and cutaneous Glands, muſt neceſſarily raiſe a Fever, and prevent the natural Diſcharges through the Excretories of the Skin? 'Tis no Wonder therefore that Nature is ſometimes in the utmoſt Confuſion, and under the laſt Diſtreſs, when theſe neceſſary Evacuations are prevented, or not promoted, as Occaſion ſerves, and as the Exigencies of Nature require.

If it is impracticable to throw off all the natural Secretions by the cutaneous Emunctories at other times, much more in the confluent Pox, where there is ſuch a vaſt Acceſſion of Matter beſides, and where Nature therefore muſt need the greater Relief from other Diſcharges: But farther, every one knows, that in the mildeſt and moſt favourable Sort of the Pox, where Nature does the whole Work, and is the only Phyſician, as ſhe procures a free and plentiful Evacuation by Sweats, ſo ſhe takes the Benefit of Stools too, and keeps the Patient rather lax than coſtive. And this affords us ſo plain and evident an Indication of what ought to be done by Art, when Nature cannot effect it, that it would be affronting the Reader's Underſtanding, to ſay any thing more about it.

IT ſometimes happens in the confluent Pox, that the Patient is ſeiz'd with a deep and ſtrong Delirium in the eruptive Fever, on the ſecond or third Day of the Diſeaſe. And in this Caſe, if the Symptoms be not ſpeedily and ſeaſonably reliev'd, it continues till Death puts an End to it. And within a few Days the Appearance of the Purples, the cold clammy and viſcid Sweats, the convulſive interrupted Breathings, and the ſpaſmodick Twitchings and Tremors of the Nerves and Tendons of the Muſcles, will proclaim aloud the Danger, and afford the Phyſician but too plain and certain Prognoſticks of the Event.

UNDER this terrible and threatening Symptom, there is one, and I think but one ſure Method of Relief that may be depended on; and that is by applying a large ſtrong Epiſpaſtick to the Head cloſe ſhaved; which takes off the Delirium, and reſtores the Patient to his Senſes within twenty-four Hours, and for the moſt Part in twelve Hours, if the Bliſter riſes and runs well.

But beſides the Removal of the Delirium, there are ſeveral other great Advantages ariſing from Bliſtering after this Manner. For the Delirium being thus taken off, the Fever is very much mitigated and reduced within moderate Bounds, and at the ſame time the Sweats break out; which afford the Patient the greateſt Relief of all, as they prevent too great an Acceſs of Matter to the Puſtles, which could not poſſibly have been receiv'd, retain'd, and digeſted, ſo as to ſecure a natural and ſafe Criſis. And the Sweats being thus once obtain'd, will require little more to maintain and keep them up, but plentiful Dilution.

But here, with reſpect to theſe Liquors or common Drinks, a due Regard ought to be had to the Conſtitution of the Patient, and his way of Living before. For to ſuch as had accuſtomed themſelves to drink much ſtronger Liquors, in great Quantities, or to Exceſs; Table-Beer, mild Ale, Wine and Water, or White Wine, Whey, will be but neceſſary Diluters. But how far the common Drinks ought to be changed or differently directed, according to the different Conſtitution of the Patient, or the different Appearance and occaſional Turns in the Diſeaſe, muſt be left to the Phyſician; ſince it would be impoſſible to give particular Directions about it, in all Caſes which may ariſe.

Two or three Days before the expected Criſis, or as ſoon as the Swelling of the Face begins to ſink and abate, it is often neceſſary that the common diluting Liquors ſhould be a little opiated with Diacodium, *Sydenham*'s Laudanum, or rather with the alexipharmick camphorated Laudanum, above deſcribed; by which Means the too ſudden and precipitated Sink of the Swelling is prevented, and Time given for a more natural and regular Criſis. But the Uſe of theſe too ſoon, and from the very Beginning of the Diſeaſe, is the moſt pernicious Practice of all, as it raiſes the Swelling too faſt, precipitates the whole Work, conſtringes the Bowels, locks up the natural Stools, checks and reſtrains the neceſſary Diſcharge by Sweats; and, in ſhort, defeats and eludes the whole Intention of Cure. Upon which the Purples, and other mortal Symptoms ſoon appear to proclaim the Violence which had been offer'd to Nature, and to pronounce Death.

Whoever duly conſiders the Matter, and obſerves what Nature ſometimes effects, muſt be convinced that a Fever is not eſſential to the Small Pox, that it always ſucceeds the better with the Patient, the leſs of a Fever he has, and beſt of all when there is no Fever.

I HAVE known ſeveral Inſtances of Perſons having the true and genuine Small Pox, eſpecially Children from ſeven to ten Years old, without the leaſt Confinement, Loſs of Appetite, or any Symptoms of a Fever. But this very often happens to Nurſes, and ſuch as are continually about the Sick, eſpecially when they lie in Bed with Children, or take the variolous Effluvia from them in ſhifting, dreſſing, undreſſing them, *&c.* In ſuch Caſes, I ſay, they have often a pretty plentiful Crop of Puſtles ariſe, of the true genuine Pox, under all its Types, and which take the natural and due Time in riſing, ripening, and falling off; but without any Fever, Sickneſs, or Loſs of Appetite. 'Tis therefore a vulgar Error, to ſuppoſe that a Perſon who has once had the Small Pox, is not liable to it again, or may not have it a ſecond or third time; ſince this often happens, and might be prov'd beyond all Exception, from numerous Inſtances. But then, when it thus attacks a Perſon who had had it before, the Puſtles are always of the diſtinct Sort, and without a Fever. The Reaſon of this, from what has been ſaid before, I ſhall leave others to account for, and only content myſelf with the plain Matter of Fact.

FROM all that has been here advanced and obſerv'd, I may draw this general Conſequence, that the variolous Fever is to be taken off by the ſame Means and Methods as are found moſt available in the Cure of other Fevers. And that the Fever here is only an accidental and occaſional, but not a natural and neceſſary Concomitant of the Diſeaſe. And therefore the Opinion which has been taken up with, and reſted in by ſome of the Faculty, that the Fever in this Caſe is neceſſary to the due Excluſion, Growth, and Maturation of the Puſtles, is ſo great a Miſtake, ſo groſs an Error, and ſo contrary to all the true Indications and Intentions of Cure, that if any thing could be ſurprizing, one might well wonder how ſuch a Notion ſhould be ever receiv'd, or how any Being in Nature ſhould inſpire ſuch a Sentiment, but the Devil himſelf.

IN the Gout, Sciatica, and Rheumatiſm, which are always attended with a Fever, *ſui generis*, the Method of Sweating is equally available and effectual, as in other Fevers. For by this Means, the Swelling of the Parts is brought on, and the Pain taken off in about twenty-four Hours; which muſt otherwiſe have rack'd and tortur'd the Patient for ſeveral Weeks, or, perhaps, Months together.

It is true indeed, that in the Sciatica or Hip Gout, the Buſineſs is not ſo ſoon or eaſily done. For this Sort of Gout is generally more obſtinate and laſting than any other, where the Matter falls upon the more extreme Parts. And therefore it is often neceſſary, in this Caſe, to apply a large ſtrong Bliſter to the Part affected; by which Means, in the Uſe of Diluters freely and plentifully given, the Sweats are obtain'd, and the Pain taken off in a few Days; which might otherwiſe have worn out the Patient, and carry'd him off after a long Languiſhing, without Eaſe or Appetite.

I shall only here ſtay to exemplify this Method in one Caſe more, which is in the Buſineſs of a Phthiſis or Conſumption, as the Conſequence of taking Cold by ſome occaſional ſudden Check of Perſpiration and Sweat; which often with us in *England*, iſſues in a dry Catarrh, and at laſt in a Conſumption; which is a Diſeaſe that we are more remarkable for than any other People in *Europe*.

If upon any ſuch Accident the Perſon affected is put to Bed, and ſweated freely and plentifully for eight or ten Hours, and theſe Sweats ſuſtain'd and ſupply'd with a ſufficient Quantity of proper Diluters as before, all farther ill Conſequences are hereby prevented; the natural Perſpiration is reſtored, and the Cough and dry Catarrh guarded againſt: But when this is neglected, the natural Conſequences will be ſuch as theſe; When the natural Evacuation by Perſpiration and Sweat is obſtructed, the obſtructed Matter ſeeks an Exit by the Glands and Secretories, that are moſt open and yielding, and where it meets with the leaſt Reſiſtance, that is by the excretory Ducts of the ſalival Glands and Tonſillæ, which laſt in the common and uſual Courſe of Nature diſcharge a greater Quantity of Matter into the Gula, than all its other Glands.

BUT the Tonſillæ being now ſurcharged with redundant Matter preſſing for an Outlet, they are hereby ſwell'd, harden'd, and obſtinately obſtructed. And now, inſtead of a ſoft oily Lymph, which is their natural Evacuation, they can diſcharge nothing but a thin, acrid, and irritating Water or Rheum: And this falling upon the Larynx or Valves of the Trachea, by a continued Stimulus and Irritation, urges a Cough; which at firſt is but weak, and not much taken notice of, but ſtill grows more and more violent and ſtraining, till at length theſe pulmonary Valves, by a continued Irritation and Stimulus, begin to ſwell, harden, and gradually loſe their natural Elaſticity and proper Action.

AND now the Cough grows more violent, the obſtructed Tonſils break and run; and the violent Irritation of the Tracheal Valves occaſion ſuch Shocks upon the Lungs, as derive a great Surcharge of Matter to them, at firſt heating and inflaming, and at laſt ulcerating them. And in the mean while the tracheal valvular Muſcles, the Tonſils, and the Gula, clear down to Oeſophagus, are often excoriated and ulcerated, as I have frequently ſeen in Diſſections.

BUT when the Matter is come to this Paſs, nothing can be ſwallow'd, or taken into the Stomach, without the utmoſt Pain and Anguiſh; and then the Patient can have no other Hope but in God, for Phyſicians are of no Value.

BUT during the Continuance of the dry Catarrh, and before the Cough comes to be purulent and rotten, ſomething may be done.

AND here I ſhall propoſe the only Method which I have ever found effectual or ſucceſsful in ſuch Caſes: I mean for the Cure of a dry Cough and Catarrh, after it comes to be thoroughly fix'd, and the ſweating Method had not been follow'd at firſt. And here, though I muſt ſpeak it without glorying, I have try'd all the moſt celebrated Pectorals to no Purpoſe, but only to convince me how vain and inſignificant they are. But I could never find any thing effectual, but giving Calomel, or ſome ſuch moderate Mercurial, to raiſe a ſlight and gentle Salivation, and ſet thoſe Glands a running, which had been ſo obſtinately obſtructed and lock'd up. And this I have found ſo ſucceſsful, that I dare pronounce it the moſt effectual Method, where the firſt Intention of Sweating had been neglected.

SCHOLIUM.

ONE Dr. *Theophilus Lobb* about three Years ago publiſhed a large Book, which he calls, as I remember, *A Treatiſe on the Small Pox.* This Gentleman runs moſt exceſſively into the ſpecifick Way, and can ſcarce talk of any thing elſe, but the aſſimulating and transforming Powers and Properties of Medicines, and morbid Matter.

HE ſhews himſelf to be ſo much a Maſter in the corpuſcularian and ſpecifick Philoſophy, that any one who knew no better, might think he had got the Secret of the Philoſopher's Stone. But however this be, ſome may think that he has made one Diſcovery in his Book, which he might as well have kept to himſelf: For it appears from the great Quantities of very nauſeous or abſolutely indigeſtible Drugs, with which under the Notion of ſpecifick Alteratives upon the Blood, he is continually plying his Patients, that he muſt have been at leaſt in the main his own Apothecary.

BUT this might be only a Point of Prudence, or perhaps Neceſſity, in a Country Phyſician, to keep Drugs enough by him, and to make his Patients at leaſt pay handſomely for theſe, if they will give no Fees; provided they are not forced with more than they can take, or more than would do them good, if they could take it. However, whether this has been Dr. *Lobb*'s Caſe or no, I ſhall not determine; but leave it to the Judgment of others.

BUT what makes me take Notice of him, is a peculiar Method which he propoſes, of curing the Small Pox within the two or three firſt Days of the Diſeaſe, and without any Eruption at all of the Puſtles; and this by a Specifick of his own. And this his grand ſpecifick Alterative is no more than Æthiops Mineral; which, as I have prov'd, and as his great Maſter *Boerhaave* could have told him before, cannot poſſibly paſs the Lacteals, or mix with the Blood at all.

HOWEVER, he would have it given to the Quantity of an Ounce, together with two Drachms of Cochineal, within the Space of twenty-four Hours. And becauſe ſuch a Quantity of Cochineal, in the Time given, might be apt to throw the Patient into a large and profuſe Sweat, the Doctor has taken Care to prevent any ſuch natural Effect of the Medicine, by acid and nitrous Draughts, and other antiphlogiſtick Remedies in caſe of Need, that ſuch a pernicious Evacuation as Sweating might not defeat and elude the whole ſpecifick Intention.

I WILL not here preſume to ask the Doctor why he ſhould order ſuch a Quantity of Cochineal with the Æthiops, if he did not deſign the Patient ſhould ſweat, ſince perhaps he would ſay that this was deſign'd to direct the Æthiops towards the Skin, where it might lay hold on the morbid Particles with the better Advantage, in order to their

Converſion. But as I know nothing of this Sort of Philoſophy, I am reſolv'd not to diſpute about it.

BUT there is one general Objection, which I cannot help forming to myſelf, againſt theſe boaſted Effects of ſpecifick Remedies upon the Blood and animal Fluids, which is this; That no ſuch Effects could ever be prov'd, by any plain unexceptionable Facts or Experiments. Whether Æthiops Mineral is capable of paſſing the Lacteals, and mixing with the Blood within the Body or not, is doubtful; and all the Experiments we can make upon it, muſt determine the contrary. But ſuppoſing this, what Alteration can it make upon the Blood, or any other animal Liquor, when actually mix'd with them, out of the Body? Will it hinder the Blood or other animal Fluids from any Sort of Corruption, Putrefaction, or preternatural Ferment; or will it alter the Qualities of any virulent, peccant, or corrupted Matter, and make it innocent and wholeſome? Let the wonderful tranſforming Power of any boaſted Specifick be once prov'd by any ſenſible Fact or Experiment, and then one might begin to think that ſuch Praters are more than Quacks.

'TIS evident, that at the Commencement of the variolous Fever, the obſtructed morbid Matter is already collected and formed, and that Nature is now hard at work in puſhing it out towards the Surface, in order to diſcharge herſelf, and get rid of it. And theſe Struggles and Efforts of Nature, to throw off the obſtructed Matter, raiſes the Fever; *i. e.* the obſtructed Matter is the Cauſe of the Fever, and not the Fever the Cauſe of the obſtructed morbid Matter.

IT is therefore an extraordinary Contrivance to hinder the Aſſimilation of the morbid Particles which were aſſimilated before, and to convert and transform them again into good Blood and Humours, by retaining them in the Body, without throwing them off by any Evacuations at all. Could this learned Naturaliſt have given any Inſtances in which Nature cures the Small Pox without any Eruption of Puſtles, he might have had ſome Ground for his Hypotheſis; and I ſhould never have objected, while he was following Nature: But ſince he has found out a new Method, above Nature, I hope he will give me and others leave to think that he is never the wiſer for it.

I CANNOT however but agree with Dr. *Lobb* in one thing, and that is in his humble Petition to the King, that his Majeſty would be graciouſly pleaſed to ſuffer this his new Method to be firſt of all try'd upon ſome condemn'd Criminals. Which Application and Requeſt I take to be highly reaſonable, ſince I am clearly perſuaded that ſuch a Method ought not to be try'd upon any Man who has the leaſt Right or Title to his Life.

It muſt be ſuppoſed, that this Author could not have writ ſo large a Book upon Phyſick, without talking of the Nerves, and the Influx of the *Animal Spirits*, as the Cauſe of muſcular Motion; which he has left with a *q. e. d.* or as a Matter of Demonſtration. But I ſhould ſcorn to diſpute this with Dr. *Lobb*, or any other ſuch learned Mechanicians, who would ſeem to be Maſters of all Nature, without underſtanding or being able to apply any one ſingle Principle, or Law of Motion. I ſpeak this very freely, and without Heſitation, as not at all ſuſpicious of being call'd to an Account for it, by any ſuch ſort of Mathematicians and Philoſophers.

PROPOSITION XIV.

To explain the moſt ſenſible and obvious, or mechanical Effects of crude Mercury, or Quickſilver.

UNDER this Propoſition, I intend only to conſider the obvious and ſenſible Effects of Mercury, with Reſpect to the ſeveral Ways, and different Quantities, in which it is or may be given, as either crude or prepared. And here I ſhall confine my ſelf to well atteſted and indiſputable Facts, leaving others to reaſon upon it in their own Way, and draw what Conſequences from it they pleaſe.

I HOPE, therefore, I ſhall not be here thought to make my ſelf a Party in a Matter which is yet *coram judice,* and not well agreed on among the Phyſicians. And if at the ſame time, while I am talking of Facts, and appealing to Experience, I ſhould now and then venture to give my own Opinion and Account of them, againſt ſome Gentlemen, who may be otherwiſe minded, I ſhall expect to be indulged in this, or at leaſt not cenſured till I am confuted. But if any ſhould be ſo teſty as not to admit me this Favour, they may pleaſe to underſtand that I am reſolv'd to take ſuch a Liberty, whether they would be willing to grant it or not. Upon this Principle and Reſolution, I ſhall venture to lay down the following Obſervations, as certainly true in Fact, and from Experience.

1. CRUDE Mercury, or Quickſilver, may be given to an Ounce or two every Day, for a Month, five or ſix Weeks together, without any ill Conſequences attending it. And this to People of all Conſtitutions, at all Times and Seaſons, and without any Confinement, or particular Regimen.

2. MERCURY thus given will not ſalivate, nor give any plain Marks and Indications of its paſſing the Lacteals into the Blood; or at leaſt not in Quantities ſufficient to produce any ſenſible Effects in that Way. And the Caſe here will be the ſame, though the Mercury ſhould lie long retain'd in the Body, and without any Evacuation by Stools.

3. MERCURY thus given, never produces any Heat, Fermentation, Sickneſs, or any other Diſorders and ſenſible Emotions in the Stomach and Inteſtines, which are the common Effects of a Stimulus.

4. CRUDE Mercury given in a ſmall Quantity, as not exceeding eight, ten, or twelve Grains, when its Parts have been firſt ſeparated and divided, by incorporating it with Turpentine; and then made into a Pill or Bolus, will with a little Continuance ſalivate, ſweat, or run off by Urine, and give the plaineſt and moſt evident Proofs of its paſſing the Lacteals to the remoteſt Glands and Emunctories of the Body. And crude Mercury made into an Unguent, and rubb'd into the Skin, will have the ſame Effects.

5. ALL the Preparations of Mercury with Salts and Acids, act by ſtrongly vellicating and ſtimulating the Organs or ſolid Parts. And when any of theſe are over-doſed, or the Quantity given not well adjuſted to the Strength and Conſtitution of the Patient, they become corroſive, malignant, and poiſonous. And in this Caſe, all the Skill and Caution in the World cannot ſometimes prevent very bad Accidents in the Uſe of ſuch Mercurials.

6. ALL ſcorbutick Taints and Eroſion of the Veſſels, and even the Venereal Lues itſelf, may be perfectly cured by Mercury, without Salivation; ſo far as theſe Diſeaſes are capable of any Cure by Mercury at all.

From theſe Obſervations in Fact, the following Principles and Grounds of Practice will hold good. And here the Conſideration of the practical Method will farther confirm and ſtrengthen the Facts themſelves, as already ſuppoſed and laid down.

From the two firſt Obſervations, it appears, that Mercury given to an Ounce or two, or more for any given Time, ſo far as it has been hitherto try'd, never goes farther than the firſt Paſſages; and whether it be retain'd in the Body for a ſhorter or longer time, it makes its Exit at laſt by the Anus, and comes off either by Stools, or in its natural State without Stools. And therefore they are very much miſtaken who would carry the Intention farther, and ſet it up as a Catholicon, by giving it, and expecting Relief from it in all Caſes indiſcriminately. But then, thus much may be ſaid of Quickſilver, in this way of giving it, that if it does no Good it will do no Hurt; which can hardly be ſaid of any other Medicine that is of any Power or Efficacy at all.

I know the popular Prejudice againſt this Way of giving crude Mercury, has been very ſtrong; and this Prejudice has been ſtrengthened and confirmed as much as poſſible, by ſome Gentlemen of the Faculty, whoſe learned Fears and Apprehenſions about it, have been altogether as vain and ill grounded as thoſe of the common People or Populace themſelves. But theſe learned Prejudices or Reaſonings without Experience, have taken but very little or no Effect. For though People may be at firſt frighted, yet they can never be argued out of their Senſes, or be long kept under the Apprehenſions of Danger, where they can ſee none, from a vaſt Number of Trials made upon their Neighbours, and in the Country all around them.

THE corroſive and poiſonous Qualities of Mercury, which have been ſo much dreaded, have been only ſuperinduced by Art, and as the Effects of the over Induſtry of chymical Empyriciſm; whereas there are no ſuch original Qualities in the thing itſelf as Nature has prepared it. But on the contrary, it is the greateſt, the ſafeſt, and the moſt effectual balſamick Healer and Cleanſer in the World.

IT is true, indeed, that crude Mercury will always make its way where it meets with the leaſt Reſiſtance. And therefore, when there happens to be any Impoſthume, or Ulcer and Abſceſs in the Stomach or Inteſtines, it has been found upon Diſſection, to be lodged and retain'd in the ſinuous Cavities of ſuch Wounds or Abſceſſes. But then it lies very innocently and quietly there, without giving the leaſt Mark or Symptom of any Heat, Inflammation, Fermentation, or Eroſion of any Kind, as occaſioned by the Mercury. And whatever ſome Phyſicians may think, the Surgeons could give very numerous and plain Proofs of this, who find Mercury to be the beſt and moſt effectual Cleanſer and Healer, in old, inveterate, and malignant Wounds and Ulcers of every Kind ; and they accordingly make uſe of it in their Practice, when they cannot obtain the End by any other Means. And therefore, to aſcribe any ſuch Wound, Ulcer, or Abſceſs to the Quickſilver, which may chance to have lodged in it, is a Concluſion fitter for a Farmer than a Phyſician.

QUICKSILVER given as above, diſſolves, cleanſes, and carries off all the Coagula and viſcid Concretions of Matter in the Stomach and Inteſtines ; and this effectually and ſafely, without any Stimulus, Sickneſs, Pain, or Trouble, even in the weakeſt and moſt languid Conſtitutions ; and that with infinitely better Succeſs, than the moſt powerful Emeticks, and Catharticks, with thoſe who have Strength enough to bear their Operation. And while it thus diſſolves, attenuates, and carries off all the

Foulneſſes, and viſcid Concretions of the firſt Paſſages, it is ſo far from impairing the Appetite, or weakening the Viſcera, that on the contrary it ſtrengthens and fortifies them: Which cannot be ſaid of any other deterging Method upon the concoctive Organs, that is more rough or continued for any Length of Time. And this I hope may be ſufficient to juſtify and recommend the Practice in ſuch Caſes, without ſetting up the Medicine as a Catholicon, or pretending it to be good for every thing.

BUT I cannot help ſaying farther, that in moſt chronick Diſorders, where there is any great Foulneſs, or viſcid Lodgments in the firſt Paſſages, it would be beſt to begin with this Method, whatever might be neceſſary afterwards; eſpecially in ſuch hypochondriacal and hyſterick Patients as can hardly bear any Emeticks or Catharticks at all. For though crude Mercury thus given is not properly a Cathartick, and much leſs an Emetick, as having nothing of a pungent or vellicating Nature in it, yet in ſuch Caſes of Cleanſing, where a ſtimulating Medicine cannot be born, it anſwers the End of both much better than either.

I HAVE ſufficiently guarded already againſt the Suppoſition, that Quickſilver thus exhibited, can reach the remote Glands, or purge off the Foulneſſes of the Blood and Humours, by the excretory Ducts in general. For though I have given it for ſeveral Years, and to all Sorts of Conſtitutions, yet I could never obſerve any ſuch Effects from it, nor had ever any ſuch Intention in giving it.

BUT I muſt here own a thing which happened in a particular Inſtance about three Years ago. It was of a Gentleman, who upon ſwallowing half an Ounce of Quickſilver, had a pretty free and plentiful Sputation raiſed by it, which continued for eight or ten Days before it went quite off. But this, without any the leaſt Swelling, Pain, or Uneaſineſs attending it. I thought this ſomewhat extraordinary, and aſcrib'd it to ſome ſmall Globules of the Mercury, which might ſtick to his Teeth, or get between them; and ſo be taken up and abſorbed by the recipient Lymphaticks. But however that might be, I had never obſerv'd any ſuch thing before, nor have ſince taken notice of any thing like it; though I very often give it to two Ounces a Day for three Weeks or a Month.

BUT 'tis certain, that Mercury given after another Manner, though but a few Grains, will, by a little Repetition, produce very conſiderable Effects, and generally raiſe a Salivation, if it be not prevented either by Purging, or by promoting Perſpiration and Sweats. Nay, I have known ten Grains of Calomel raiſe a Salivation, which has continued for a Fortnight or more, without any farther Repetition; and though it has paſs'd downwards by Stools too. And even by rinſing the Mouth, and rubbing the Gums a little with Water ſomewhat impregnated with any ſaline Mercurial, the ſame Effect will ſometimes follow, where ſcarce a ſingle Grain of the Mercury can be ſuppoſed to have paſs'd through the Skin.

FROM theſe Facts, and many others which might be mentioned of the ſame Kind, it may appear, that the Cure of Diſeaſes by Mercury, does not depend on throwing a great Quantity of it into the Blood at once, or within a little time, before Nature can have an Opportunity of diſcharging it by any of the Emunctories. This Practice is always hazardous, and can never be neceſſary.

THE true Uſe of Mercury, when it is artificially raiſed into an Effluvium, and convey'd beyond the *Primæ Viæ*, is to attenuate and diſſolve any viſcid Concretions of morbid Matter in the Ventricles of the Glands, and membranous Cells of the Body, to be afterwards determined to, and diſcharged by ſuch Emunctories as can carry off the greateſt Quantities of it in a given time, and with the leaſt Hazard, Pain, or Inconveniency to the Patient. And this is the natural genuine Effect of Mercury, when large Quantities of it are thrown in upon the primary concoctive Organs, without any Deſign of paſſing it farther; namely, to diſſolve and carry off the viſcid Concretions in the Stomach and Inteſtines.

'TIS evident, that a mercurial Effluvium muſt be more forcible and effectual than any other, not only as it is ſpecifically heavier, but chiefly as its ſmall Parts or Globules, when thus divided and ſeparated from their Points of Contact, are endued with a vaſtly greater attracting and diſſolving Power, than any other Fluid in Nature; or indeed than other Subſtance, whether ſolid or fluid, that can be thus eaſily raiſed into a Vapour, and thereby ſuſpended in any other Fluid, though a thouſand times ſpecifically lighter than itſelf.

BUT when the mercurial Effluvium has thus attenuated and diſſolv'd the Concretions of the peccant Matter in the Glands, and membranous Cells, the Matter thus prepared may be determined to, and carried off by any of the natural Emunctories, without any farther Uſe or Action of the Mercury itſelf. For the peccant and obſtructed Matter being thus once prepared, fitted for Evacuation, and determined to the proper Emunctories, from which the Diſcharge is intended; the continued Exhibition of the Mercury afterwards would be not only uſeleſs, but highly pernicious: Of which innumerable Inſtances might be given from daily Experience.

'TIS certain in Fact, that any Emunctories or glandular Excretories being once opened, and having loſt their elaſtick Tone, or reſtitutive Force, by over-ſtretching and ſtimulating, if they are not afterwards obſtructed by any viſcid coagulated Matter, will continue an extraordinary Diſcharge, for a long time; and often during the Life of the Patient, without any Poſſibility of ſtopping it, but by running a ſtill greater Riſque. And of this I ſhall here give ſome unexceptionable Inſtances, leaving the Reader to collect the reſt from his own Obſervation and Experience.

IN a Diabetes, or in any hypochondriacal or hyſterick Profluvium of Urine, the renal Glands and Emunctories being once overſtretched and ſtrain'd, whatever might have been the Cauſe or Occaſion of it at firſt, will continue in this lax State to make an ex-

extraordinary Diſcharge upon every ſlight Occaſion; or perhaps, as long as the Patient lives. And though in this Caſe the original Cauſe may be taken off, or ceaſe to act, yet the Effects of it will, or may be long and laſting; and will continue upon the Organs or Secretories, unleſs they can be reduced to their due Tone, Tenſion, and natural Conformation. And the Caſe is the ſame in any occaſional Relaxation of the cutaneous or inteſtinal Glands and Secretories.

In a moiſt or ſpitting Aſthma, where the ſalival Glands and Secretories have been over-ſtrained, relaxed, and weakened, by any large Diſcharge long continued, it is often impracticable to reduce them, and to ſtop this Evacuation, without doing more hurt than good. And in a Pox or venereal Lues, where People have been treated with violent Salivation, they are often as long as they live continually throwing off large Quantities of a thin, ſharp, and fœtid Matter from the ſalival Glands, though the Diſeaſe ſhould never return upon them more: Which peccant Matter is plainly generated by ſuch a preternatural Evacuation, brought on as before.

But though ſuch an exceſſive Diſcharge from the ſalival Glands, is a Method which

Nature ſometimes takes by a mechanical Neceſſity, and for want of a better or more effectual Relief, yet 'tis far from being, at any Time, or in any Caſe, an original natural Intention. And conſequently, though it may be ſometimes right to encourage and promote it, where it is otherwiſe brought on, and cannot be prevented, yet forcing it at firſt is contrary to all the true Indications and Intentions of Nature.

IN a common Cold, the Glands of the Mouth and Throat are often very much ſwell'd; and when this is come to a Height, a plentiful Diſcharge of a thick, ſoft, and digeſted Matter from thoſe Glands will be neceſſary, before it is well over: And at beſt the getting rid of the redundant obſtructed Matter in this way, requires a great deal of Time and Patience, as it is often very painful and troubleſome. But all this might have been prevented at firſt, and the whole Buſineſs have been done in a Day or two by Purging and Sweating.

IN the confluent Small Pox, a plentiful Diſcharge by Spitting is often the only Method that Nature can take for any Evacuation at all, while, perhaps, ſhe is deny'd the Benefit of Stools; and nothing is more dreaded than Sweating, which yet would give a much more certain and effectual Relief, and render the Sputation in a manner needleſs, as we always ſee in Perſons under this Diſeaſe, who are favoured with the diſtinct Sort, or where Nature obtains her own Intention, without the wrong Judgment and Opinion of others.

But having obſerv'd thus much, I would only here leave it to the Judgment of Phyſicians, whether Salivation be the ſafeſt and moſt effectual Method of curing Diſeaſes, which require the Uſe of Mercury? Or whether a much greater Quantity of any morbid peccant Matter may not be attenuated, diſſolv'd, and carried off in a given time, by other Emunctories, eſpecially the cutaneous Secretories, in a much more ſafe, effectual, and eaſy way? And here, though I might prove the Affirmative by a great Number of the moſt unexceptionable Facts, yet I ſhall leave the Matter to the Conſideration and Experience of others; only excepting Dr. *Cam* of *Bow Church-yard*, who having declared his Opinion already againſt this or any other Method, not under his own Management, I think he cannot be a proper Judge, and ſhould not be willing to be try'd by him.

PROPOSITION XV.

To conſider and explain the morbid Symptoms and Diſorders of Breeding Women; with their natural Cauſes, Prevention, and Cure.

THE vaſt Number of Women who either miſcarry, or die in Child-bearing, and the unhappy Influence of this Calamity upon private Families, and publick Societies, cannot but move Compaſſion from the common Principles of Reaſon and Humanity. And therefore, in attempting to render this Part of human Life leſs grievous, I hope I ſhall find Pardon at leaſt, if I deſerve no Thanks.

IT may be obſerv'd, that in the Country, where People are uſed to the free open Air, conſtant Exerciſe, and a plain Way of Living, the Women generally breed without much Sickneſs, Pain, or Inconveniency. They go about their ordinary Buſineſs, and eat and drink as uſual, till the critical Hour is come; and then they are ſafely delivered, and every thing does well. But in Cities and great Towns, eſpecially among the *better Sort*, the general State of the Caſe is quite otherwiſe.

For here, the Want of freſh Air, an indulged Indolence and Inactivity, with a too modiſh and delicate Regimen, having obſtructed the natural Secretions, induced a viſcid, hot, and flatulent Diſpoſition of the Blood and Humours, and thereby clogg'd the Springs of animal Motion; an enfeebled broken Conſtitution, and a ſickly ſhort Life are the natural Conſequences of it univerſally, but eſpcially to breeding Women and Children; from whence the Evil is commonly propagated to the whole Species, and through every Stage and Period of Life.

It ought therefore, in the firſt Place, to be the principal Care and Concern of every breeding Woman to keep her Mind as compoſed, ſerene, and chearful as poſſible, and moſt induſtriouſly to guard againſt all the Ruffles and Emotions of the painful perturbating Paſſions; ſuch as Anger, Fear, Grief, Anxiety, *&c.*

All terrifying Objects, and diſguſtful ſenſible Images of Things, are by the wonderful Mechaniſm of Nature, communicated from the Mother to the Child, and from thence back again, by a ſort of mutual Reciprocation. And from hence it comes about, that breeding Women, while they have this double Life and Motion, are more eaſily impreſs'd with ſuch ſenſible Objects and Images, than at other times; and find it more difficult to get rid of any ſuch Impreſſion, when they are once affected with it.

THE Mother gives the firſt Impreſſion or Impulſe to the Child, from whence it is returned with greater Force, by the natural mutual Sympathy and Communication between two equal Sufferers. And in this Caſe, the mutual Paſſion and Emotion may ſoon become unſupportable, if the Mind be not ſeaſonably quieted and ſatisfy'd about the Object, or Matter of the Uneaſineſs and Perturbation. And 'tis certain, that the moſt grievous and fatal Accidents which happen to Women with Child, may be brought on in this way, where no other Cauſe of them can be aſſign'd.

NEXT to keeping the Mind quiet and eaſy, by avoiding all Occaſions of inward Pain, Trouble, and Anxiety, the freſh open Air, and moderate Exerciſe in it, eſpecially by riding either on Horſeback, or in an open Chair, are of the greateſt Conſequence during the time of Geſtation. This ſtrengthens the Tone of the Stomach, creates an

Appetite, promotes Digeſtion; and by forwarding and aſſiſting the natural Secretions, carries off thoſe ſuperfluous Dregs and Recrements of the Chyle and nutritious Lymph, which in this Caſe muſt otherwiſe be thrown in, and lodged upon the Stomach and Viſcera.

But after all that can be done by way of Prevention, the breeding Time will often prove very troubleſome and dangerous in weak and ſickly Conſtitutions, or where any other Diſorders happen to fall in with it. And in this Caſe of diſtemper'd Breeding, the Symptoms which firſt appear after Pregnancy, are Nauſea's, Sickneſs at Stomach, and Loſs of Appetite, with Reluctance to common Foods; with Retchings and Vomiting, at firſt, only in a Morning, which by Continuance become more frequent, and return by Intervals all the Day. From this Foulneſs and Weakneſs of the Stomach, and Loathing of common Food, a deprav'd and preternatural Appetite comes on, attended with almoſt continual Longings for Things rare and out of the way; and often for ſuch Things as Nature would abhor as moſt diſagreeable and hurtful at any other time.

And yet the Gratification of ſuch a deprav'd and preternatural Appetite, even in its moſt incredible Exceſſes, is vaſtly leſs hurtful or prejudicial, than bearing the reſtleſs and moſt vexatious Deſire would have been. Nay, ſuch Gratification is often abſolutely neceſſary, to prevent worſe Conſequences. Theſe Symptoms being neglected, they are heightened and ſtrengthened, and are often follow'd with others more ſevere; ſuch as an intire Loſs of Appetite, the utmoſt Depreſſion and Weakneſs, hot, biliose, and acrid Eructations; a great Diſtention of the Stomach and all the Viſcera, with a windy Flatus, painful and difficult Breathing, Suppreſſion of Urine, hydropick Inflations of the Membranes, frequent Appearances of the Catamenia, a flatulent Cholick, and travail Pains, profuſe Flooding, Convulſions, Abortion, and Death itſelf.

FROM this Account of the Symptoms, it is very plain that the firſt and great Intention is to keep the Stomach clean, by waſhing off thoſe Foulneſſes and Recrements of the Blood and nutritious Lymph, which in this Caſe are thrown out from time to time upon the firſt Paſſages, and in which the Stomach itſelf is always the greateſt Sufferer.

WHERE this has been taken Care of at firſt, it preſerves the natural Appetite and Tone of the Stomach, and thereby prevents thoſe conſequent more grievous and dangerous Symptoms, which often follow from ſuch a Neglect.

THIS Intention, if ſeaſonably adverted to, will be ſufficiently obtain'd, and the Symptoms reliev'd, by drinking a good Quantity of ſtrong Carduus Tea in a Morning, an Hour or two before Breakfaſt; which may be done in Bed, time enough to indulge a little Sleep, and a breathing Sweat after it. But when theſe Symptoms have been of ſome ſtanding, as for Inſtance, two or three Months, or longer, the Carduus will be ſcarce ſtrong enough to cleanſe the Stomach, and waſh off the foul and excrementitious Matter lodged upon its Coats and Glands. And in this Caſe there cannot be a better Subſtitute for it, than a Tea made of the *Indian* Emetick Root, Ipecacuana, from ʒ*ſs* to ʒ*j*. upon three or four Ounces of White Wine. The Wine ought to be pour'd in boiling hot upon the powder'd Root, and ſuffered to ſtand in cloſe Infuſion, till it is cool enough to drink, and then ſtrain'd off, and drank at a Draught. This will be beſt done in an Evening, about two Hours before Bed-time, waſhing it off by drinking plentifully of warm Water, or thin Water-Gruel; after which, a Dram of Venice Treacle taken in a Diſh of mull'd Wine, will diſpoſe to Sleep, and to a breathing Sweat, during the Night; which ought always to be encouraged after vomiting.

THIS Emetick, or ſomething equivalent as the Caſe requires, ought to be repeated at proper Intervals, as the hot, viſcid, and bilioſe Matter may collect anew, during the Courſe of Breeding. But where this is taken Care of at firſt, it generally prevents any ill Accidents afterwards.

BUT this excrementitious peccant Humour being ſuffer'd to lodge upon the Stomach, and from thence to paſs downwards through the Inteſtines, when it has acquir'd a ſtill greater Degree of Viſcidity, Heat, and Acrimony, is the natural and moſt common Cauſe of all thoſe grievous and dangerous Symptoms before recounted. And the Reaſon of this is ſo evident, from the Nature of the thing, and ſo well confirm'd by Experience, that I ſhall not miſpend the Time in anſwering ſome trite and trifling Objections, which are neither grounded upon Reaſon nor Fact. But they who are afraid of mild beneficent Emeticks in this Caſe, ſhould conſider, that they ought not to retain a corrupt preternatural Stimulus in the Body, or a viſcid, acrid, and morbid Matter; which muſt ſtill grow more and more dangerous, the longer it is retain'd, and be attended with all the ill Conſequences in the World.

WHEN by this Means the Stomach has been well waſh'd and cleanſed, an Infuſion of the Bark with the Serpentaria and Cinnamon, will be of great Uſe to ſtrengthen the Stomach, reſtore the Appetite, and thereby prevent any freſh Collection of the ſame morbid Matter; ſuch as the following.

TAKE *Peruvian* Bark, half an Ounce, of *Virginian* Snake Root and Cinnamon, each two Drachms. Infuſe upon a Quart of Rheniſh Wine or Syder, and drink a moderate Glaſs, or about two Ounces in a Morning, and an Hour or two before Dinner. And by this Means, with the Uſe of freſh open Air, and moderate Exerciſe, the Breeding-time may be generally rendered ſafe, and not very grievous.

BUT the moſt terrifying Symptom of all in breeding Women, is the Appearance of the Catamenia, at a time when they leaſt expected it; and after it had been quite ſuſpended, and detach'd another way in the Service of Nature. But this Symptom, how frightful ſoever it may look, is not very dangerous, if ſeaſonably and judiciouſly apply'd to. And here I might take an Occaſion to ſhow my Reading, by quoting a great Number of *Practical Writers*, with their different and contradictory Opinions; and after all leave the Reader in the dark about it, as is commonly done. But I chuſe rather to lay down a ſhort and ſimple Method of Cure, ſuch as may always be apply'd in Practice, and will prove effectual, if the Caſe be not quite deſperate. And here, I ſay, that in ſuch a Caſe, Opium is the true and only Remedy. This never fails, where any Relief can be given; and when it will not take effect, the Trial of any thing elſe would be vain and fruitleſs, ſo far as I have yet found.

BUT then this noble and wonderful Simple cannot be depended on in the common canonical Doſes, but muſt be given, though with ſome Circumſpection, yet with Freedom, till it has obtain'd the Intention. And I dare boldly aver, that more than half the Lives that are loſt in Child-bearing, might be ſaved, were it not for a ſort of phyſical Orthodoxy, or a ſlaviſh Submiſſion to Authority in this Caſe.

AND 'tis the excellent and divine Property of this Drug, that where it is required in its largeſt Doſes, to anſwer any Intention upon the lower Viſcera, it does not much affect the Head, or not ſo much as a tenth Part of the ſame Quantity might do at another Time, and under different Circumſtances.

AND if this Diſorder in Women with Child ſhould be attended with a Fever, of any ſort, the Caſe will be ſtill the ſame. for the moſt threatening Symptom muſt be apply'd to firſt; and when this Symptom raiſes a Fever, as it often does, there can be no other rational way of applying to ſuch a Fever, but by taking off the Symptom which is the Cauſe of it. This Symptom therefore in Child-bearing Women, ought always to be preſently attended to, and regarded; for otherwiſe the Loſs of a very little time will be loſing all.

THERE is not a more common Cauſe of theſe Misfortunes, than a ſtrong and reſtleſs Appetite and Inclination not gratify'd and appeaſed by the thing longed for. And when this Deſire happens to fix upon any thing that cannot preſently be got, it is a very great Unhappineſs, and often an irretrievable Miſchief.

BUT when this happens, there is nothing to be done but to have Recourſe to the free Uſe of Opiates, till the thing long'd for can be obtain'd, and the painful and moſt ſtimulating Deſire pacify'd.

BUT it ſometimes happens, and I wiſh I could ſay but ſeldom, when the thing thus deſir'd, and the reſtleſs Appetite ariſing from it are kept as a great Secret, by Perſons ſo affected, till perhaps the Remedy may be too late; and then the Conſequences of it, however fatal, muſt be taken and made the beſt of.

THIS criminal Silence and Reſerve, for I can give it no better Name, is ſo often attended with ſuch ill Conſequences, both to the Perſons affected, and to their Families and Off-ſpring, that perhaps it might be reaſonable enough to make it legally penal.

WOMEN of a weak and ſickly Conſtitution, who have been worn out by Child-bearing, or other Diſorders, after they have eſcaped all the Accidents and Dangers of Breeding, and have brought the Birth to its full Growth and Perfection, have very often the moſt ſevere Trial to undergo at laſt, in a long, lingering, and hard Labour: And this is commonly owing to thoſe ſlow, grinding, and ineffectual Pains, which often come on before the Time, or before Nature is quite ready, or well prepar'd to throw off the Burden; and when theſe forerunning ineffectual Pains are ſuffered to continue for ſeveral Days and Nights together, or poſſibly up and down for ſeveral Weeks, as ſometimes happens, the Conſequences muſt be very dangerous, if not fatal, both to Mother and Child. For the Woman, in this Caſe, being quite waſted, and ſpent for want of Sleep, or poſſibly with a great Expence of Blood before the Birth, is no longer able to bear up and ſtruggle with it; and the Child, from the Pains and Convulſions it has undergone, often takes a wrong Poſition or preternatural Situation in the Womb, and is incapable of helping itſelf, and making the neceſſary Efforts towards the Birth, if it does not actually expire under ſuch Pains and Agonies, where Nature has wanted the proper Relief.

In this Caſe, there is often no other Remedy, but a Recourſe to Violence, in order to ſave Life, ſo far as poſſible, when the worſt comes to the worſt; but moſt deplorable is the Caſe, when for want of a more ſeaſonable and proper Relief the Matter has been brought to this.

And here it is that Opium is a ſafe and ſure Remedy, if uſed in time, and with any Judgment or Diſcretion. In ſuch Caſes, were the Efficacy of ſo noble a Drug well underſtood, and ſeaſonably apply'd, this

Work of Nature would be, generally ſpeaking, performed with great Safety, and attended but with few ill Conſequences. And one may ſay of this, as of moſt other efficacious Medicines, that when they do not obtain their End, it is not ſo much owing to any Defect in the Medicines themſelves, as to the want of a right Application of them, ſuch as the Exigency of the Caſe requires.

I KNOW it is a political Maxim in Phyſick, as well as in moſt other Caſes, to be always govern'd by Authority, and never to go out of the common Road to do Good, for fear of doing Hurt. And this may be a good Rule enough for thoſe who have no better, but can be of little or no Conſequence to a Man who knows the Power of a Medicine, and how far it muſt be raiſed, before it can reach the Diſeaſe. And therefore, 'tis a Rule and Meaſure of Action, fit only for ſuch, as not underſtanding what they are about, will never do any Good, leſt they ſhould do Miſchief. And of this I might give many Inſtances, but one may be here ſufficient to exemplify the reſt.

I WAS ſome time ago call'd to a Lady of about thirty Years of Age, who under a very hard and grievous Labour had loſt an incredible Quantity of Blood. She had before ſore this been much waſted and worn by hard Labours, with five Children within ſix Years. Upon my being abſent at the time, ſhe had adviſed with an old experienced Phyſician, of about forty Years ſtanding, who was generally, and indeed juſtly reckoned an able Practitioner. When I came to her, I found her in a manner at the Point of Death, or juſt expiring, from a vaſt Expence of Blood, and yet without the leaſt Hope or Appearance of being deliver'd. She had taken ſeveral of the warm uterine Forcers, as they are call'd, to forward the Birth, which had no other Effect but to prevent Delivery, and render the Caſe almoſt hopeleſs, from the Cauſe juſt now aſſign'd.

I TOLD the Women about her, that it was abſolutely neceſſary to ſtop the Flux, and put off the Pains for a while, till ſuch time as Nature could recruit a little, and get ready for the farther Work. They all agreed that ſhe could not bear another Flow, ſuch as ſhe had had, without expiring under it; but yet dreaded very much the ſtopping the Flux, and putting off the Pains before the Birth: But the Lady having juſt Strength enough to declare her Willingneſs and Reſolution to ſtand by my Opinion, I immediately order'd the following Draught.

℞ *Aquarum Cinnamomi hord. & Thoriacalis à* ℥j. *Elix. vitrioli Gr.* 20. *Laudani Londinenſis Gr.* 5. *Miſce fiat Hauſtus.*

BUT the Pains and Flooding ſtill in ſome meaſure continuing, and threatening farther Danger, the ſame Draught was repeated in about an Hour; which quieted all, and gave near three Hours good Sleep: After which, awaking exceedingly refreſh'd, ſhe was ſafely deliver'd, without any farther Loſs of Blood, or other ill Conſequence.

I HAVE given this rather as a general Caſe, than a particular Inſtance; for I might fill a Volume of particular hiſtorical Caſes of the ſame kind: But notwithſtanding this, or any thing elſe that might be ſaid, 'tis more than poſſible that ſeveral old experienced Midwives, and ſome grave dictating Phyſicians will object againſt it, and pretend that ſuch a Method might be dangerous, by protracting the Birth, obſtructing the natural Evacuations, and inducing a Neceſſity of delivering by Force. But from well grounded Experience and Obſervations, and from a ſufficient Number of practical Caſes, which I am able to produce, I can aſſure theſe *knowing People*, that they are in the wrong; and that under ſuch Exigencies, the Method here propoſed is the only rational and effectual way of ſaving Life. But there is one Objection indeed againſt it, which cannot eaſily be anſwered; I mean *Authority and popular Prejudice.*

It cannot be right, becauſe it has not been commonly ſo underſtood or apply'd. And this they ſay is the Reaſon which the *wild Iriſh* give, at this Day, for their cuſtomary Howlings and Wailings at Funerals, over their dead Friends. It is the Cuſtom of the *Iriſh*, and they would not pretend to be wiſer than their Forefathers: And this is a Reaſon which will ever hold good, when Men are reſolv'd to ſave that Trouble, and never to think at all.

After Delivery, eſpecially in weakly Conſtitutions, or where the Travail has been tedious and ſevere, the After-Pains are very often exceeding troubleſome and hazardous; and ſome Women ſuffer more from them, than they had done before the Birth. And here I know not how it comes about, but 'tis a pretty common Notion, that theſe Pains are neceſſary, and muſt be born, in order to promote the proper Diſcharges, and uſual Purgations in ſuch Caſes. But there never could have been a more ſenſeleſs or pernicious Opinion than this; for whenever

ever theſe Pains are very ſevere, or of any long Continuance, they keep back and coagulate the Milk, obſtruct the neceſſary Evacuations, and raiſe a very high and dangerous Fever. 'Tis very right therefore, when this happens, to call it the *Milk Fever*; for ſince this is now the principal Evacuation intended by Nature, nothing could raiſe ſuch a Fever, but obſtructing and keeping back the Milk; and there cannot be a more certain Method of doing this, than encouraging and not taking off the After-Pains.

'Tis certain, that the Obſtruction of any natural Evacuation, will commonly raiſe a Fever; and the greater or more plentiful that Evacuation ought naturally to be, the higher and more dangerous will be the Fever.

'Tis well known, that Women of ſound healthy Conſtitutions, eſpecially in the Country, where they have the Benefit of the free open Air, and Exerciſe, breed without much Sickneſs, and are ſeldom troubled with theſe After-Pains. And from hence they are freed from the conſequent Fever, and are not very careful about any thing elſe, when once they are ſafely deliver'd. But in Cities and great Towns, eſpecially among the chief Families, where the Women

men are of a more tender and delicate Conſtitution, the Caſe is quite otherwiſe; and when a Woman has been ſafely deliver'd, ſhe has ſcarce undergone half her Riſque and Danger. For the After-Pains here being often ſevere, and of long Continuance, muſt neceſſarily raiſe a Fever, obſtruct and coagulate the Milk, and prevent the due and neceſſary Diſcharges. For the Milk now becomes a neceſſary natural Evacuation, and ought to be diſcharged in very conſiderable Quantities.

'Tis therefore moſt unaccountable, and highly abſurd, when People ſet themſelves preſently at work to dry up and repel the Milk, before it has taken its natural Courſe, or had time to waſh off the Foulneſſes and Recrements of the Glands, collected in Breeding. And this is done from a Pretence of taking off the Fever, and preventing ill Conſequences; whereas in Truth, it can prevent no ill Conſequences at all, but muſt bring on a great many, while they hereby deprive the Mother of a natural neceſſary Diſcharge, and the Child of its natural and proper Nutriment. And conſequently this is a Practice which ought only to be left to thoſe who prefer Cuſtom to Nature, Gentility to Health, and who had rather die than be out of the Faſhion.

I DO not here, however, affirm, that all Women ought to be Nurſes, and give Suck to their own Children. There are, I muſt own, ſome particular Caſes, where this cannot be adviſedly comply'd with, and where a Diſpenſation may be neceſſary; but when this happens, if the Judgment form'd about it be right, the Advice thus founded muſt be always in Favour of the Child, but never of the Mother. And this is a Point of ſuch Importance, and yet ſo liable to be debated, that I think it worth while to conſider the Matter a little farther.

'TIS then certain, and a thing ſo well eſtabliſh'd from all Experience, that no Man can deny it; that no natural Evacuation can be ſuddenly ſtop'd or reſtrain'd, without the utmoſt and moſt imminent Danger. It would be tedious and needleſs to prove this from particular Inſtances, in Fact, ſince no Man who has had any Experience, or who has made any Obſervations at all, can in the leaſt doubt of it.

'TIS likewiſe certain in Fact, that a pretty free Flow of Milk is the natural and neceſſary Conſequence of Delivery after Child-bearing, and no Body can doubt, but the more naturally and regularly this Evacuation is continued, the leſs Danger there is of any ill Accidents afterwards.

But this Evacuation, it will be ſaid, however natural, may ſoon be ſtopt, and the Matter of it carried off ſome other way, by the Help of *Art*, however contrary to the Intention of *Nature*. But let Gentlemen who are in this way of thinking, give any plain indiſputable Inſtances of it, and prove it true in Fact; and then perhaps their *Art*, in Contradiction to *Nature*, might be thought of more Conſequence, or deſerve ſome farther Conſideration. But till this is done, 'tis highly reaſonably to imagine, that the Grounds of ſuch Pretenſions will be laugh'd at by wiſe men, and the Conſequences of them ſuffered by ſuch as are otherwiſe. I ſhall therefore take it as a thing certain, and granted, till the contrary is prov'd, that 'tis dangerous, and altogether immechanical, to ſtop any natural Evacuation, while it does not exceed its due Bounds; and conſequently, that the Milk, which is in this Caſe a neceſſary and natural Evacuation, ought not to be check'd, obſtructed, and driven back, upon any Pretence whatever. And therefore nothing can be more abſurd, than what is often done in this Caſe, when the Milk does not flow enough, to hinder it from flowing at all;

and thereby inducing ſuch a Coagulation of the obſtructed Fluid, and conſequent Tumefaction and Excoriation of the Glands, as muſt at laſt bring it, with great Hazard, into the Hands of a Surgeon. And though a Surgeon in ſuch a Caſe will be abſolutely neceſſary, yet I dare ſay, that his Work is commonly made by thoſe who had been employ'd before him.

UPON the whole then, I think 'tis plain, that as the After-Pains ſo often raiſe a Fever, and coagulate the Milk, it muſt be neceſſary to take off theſe Pains as ſoon as poſſible, thereby to prevent the Fever, and the many ill Conſequences of it, at this critical Time.

AND whereas it may be objected farther, that the Uſe of Opiates, as here recommended, for removing theſe Pains, may not only prevent the neceſſary Purgations at this time, but check and reſtrain the Milk too, and thereby elude the whole Intention of Nature, under ſuch an Exigence: To which I anſwer, that this can never happen, but from a very injudicious or unskilful Management: For when the Opiate has obtain'd its great Intention, and taken off the Pains, the farther Uſe of it will be needleſs, and might indeed be very prejudicial.

As ſoon as this great and principal End is anſwered, therefore, the Opiates ought to be laid aſide, and then any of the common, known, and approv'd, uterine Detergents, will promote and carry on the neceſſary Diſcharges, and effectually prevent any farther ill Conſequences. But what I prefer in this Caſe, as a general, ſafe, and effectual Promoter of theſe Diſcharges, when the Symptoms require it, is a Mixture of the Elixir Proprietatis, Tincture of Caſtor, and Sal volatile oleoſum, in equal Parts; which may be given in Drops, or to a Tea ſpoonful, in Penny-Royal Tea, or any appropriated Julip out of the Shops.

But to return to the Milk, I may venture to ſay, that there is not a more common Cauſe of fixing and radicating the hyſterick Conſtitution, with all its Symptoms, in Breeding-Women, than this unſeaſonable checking and reſtraining ſo natural and neceſſary an Evacuation. This cannot be done without defeating Nature in one of her main Intentions: And therefore if the Milk ſhould not agree with the Child, or the Circumſtances of the Mother ſhould be ſuch, that ſhe cannot give Suck without ſome manifeſt Danger, which perhaps might ſeldom happen; this Diſcharge however, ought to be continued, and promoted, by drinking more freely, and in larger Quantities, and getting the Milk conſtantly drawn by a Nurſe for ſix or eight Weeks; after which, if need be, it may be ſuffered to go off without much Danger.

SOME pretend to certain Specificks and Noſtrums for increaſing Milk in Nurſes, but I think there can be no great Secret in this. 'Tis certain, that nothing can breed Milk but Liquors; and any common Drinks, in ſufficient Quantities, will produce enough of it.

THE moſt common Cauſe of bad Nurſing, and the Inconveniencies of giving Suck, is not drinking enough while this Diſcharge is carrying on. Four or five Pints a Day is a very moderate Quantity for any Woman to drink in giving ſuck, if ſhe make a tolerable good Nurſe. When this is not regarded, the unskilful or unpractiſed Nurſe is ſoon drain'd out of all her Spirits and Strength, for want of proper and neceſſary Supplies, under ſuch a conſtant Evacuation; and in the mean while, the Child, inſtead of deriving a natural proper Nouriſhment, is only fill'd with a ſharp windy Flatus, and in great Danger of falling into Convulſions.

Next to the Quantity, the Quality of the Liquors taken in, is chiefly to be regarded. And here the Drink, or potable Liquors, ought not to be too low, raking, and depreſſing, ſuch as Tea, Coffee, weak or ſoweriſh Small Beer, will be apt to affect the Child with Vomiting, Purging, ſharp bilioſe Cholicks, and other Attendants of an Atrophy or Conſumption: As, on the other hand, ſtrong vinous Spirits, and all Liquors too hot, and highly fermented, will produce an inflammatory febrifick Milk, and bring on all the Effects of an hot ſcorbutick Flatus.

Of all other Liquors for Nurſes, I take a fine, ſmooth, well fermented Table-Beer, or a very mild ſoft Ale to be the beſt, or Milk and Water for the poorer Sort, and ſuch as cannot afford the former. Though ſtill it muſt be allow'd, that there are ſome Circumſtances, in which other Liquors may be indulged, and a Change may be ſometimes convenient, if not neceſſary; as to a Phyſician, who has thoroughly conſider'd the Caſe, will be fitteſt to be adviſed with.

Having thus taken notice of the moſt common and threatening Symptoms which are incident in Child-bearing, I might put an End to theſe Obſervations, if the Caſe of Hæmorrhages, or any larger Profuſion and Loſs of Blood, upon what Occaſion ſoever it happens, did not require ſome farther Conſideration. But after weighing the great Importance of this, and the general Concern of Mankind in it, I cannot diſmiſs this Subject without a more particular Diſcuſſion.

THE only Caſe in which a periodical Evacuation of Blood is truly natural and neceſſary, is that of the menſtrual Diſcharge: And a due Regard to this, is a Matter of ſuch Conſequence in Women, that their whole Conſtitution, as to Health or Sickneſs, in a manner depends upon it, and moſt female Diſorders and Complaints, from fourteen to forty eight, are owing to ſome Exceſs or Defect of this natural Evacuation.

THAT great Man, and truly learned Phyſician, Dr. *Freind*, who has writ beſt upon this Subject, and given the moſt rational Account of it, ſuppoſed and maintained, that this Evacuation, in its natural State, conſiſted only of Blood from the ſmall Arteries, occaſioned by a monthly Plethora, or Over-fulneſs and Turgency of the Blood-Veſſels; which Redundancy of Blood, he concluded to be thrown off this way, by the Mechaniſm and natural Structure of the Parts; which he has very accurately deſcrib'd ſcrib'd and explain'd. But that learned Man was certainly miſtaken, in ſuppoſing that this Evacuation conſiſts only of the ſimple and pure arterial Blood; for the contrary may be clearly prov'd, as true in Fact, and from all Experience, which is what I ſhall now briefly attempt:

If the Intention of Nature in this Evacuation, was only to remove a Plethora of the Blood-Veſſels, and thereby to get rid of a Redundancy of Blood, 'tis manifeſt that the ſame End might be obtain'd by Bleeding, or taking off the ſame Quantity of Blood from any of the Veins or Arteries, whenever it is not thrown off in the common natural way. This is a ſhort and ſure Method of Relief, where the Cauſe is only a Plethora of the Blood-Veſſels, or a Redundancy of Blood.

For ſince the whole Maſs of Blood, in all its Parts, muſt neceſſarily communicate with all the other Portions of the ſame Fluid, in Conſequence of the common Circulation, where-ever a given Quantity ſhall be taken off, the Fluid muſt ſoon recover its Æquilibrium, by a common and well known Law of Fluidity. And hereby any Plethora might be remov'd, ſo far as conſiſts in a Redundancy of Blood; but yet 'tis certain from Experience, that Bleeding will not anſwer the End of Nature in this Evacuation. So far from it, that though it may give ſome preſent Relief in a few particular Caſes, yet by diverting Nature from her proper Work, and turning her off her Bias, it generally does great Miſchief, and often renders the Diſeaſe deſperate, that might have been eaſily managed at firſt, by procuring the natural Evacuation, and regular Diſcharge.

BUT farther: When this Evacuation is ſuſpended or obſtructed, ſo as to become a Diſeaſe, the Conſequence is not a ſanguinary Plethora, or Redundancy of Blood: But, on the contrary, the Blood, in this Caſe, will be defective in Quantity, as not being generated in its natural and due Proportion, and at the ſame time the Blood loſes its natural Warmth, Strength, and Vigour, by the Retention of another Secretion which ought to paſs with it.

THE pale Complexion, the low Pulſe, the Coldneſs, Weakneſs, and Languors of thoſe who labour under this Diſorder, are evident Indications that they do not abound with Blood; and while they are, in the mean while, ſwell'd and bloated up with hydropick, ſcrophulous, ſcorbutick, and other Tumours, the plain Indications of a membranous and glandular Plethora, 'tis evident from all the Symptoms, that it is not Blood, but ſomething elſe that is the prevailing and redundant Humour in them. And this, I think, is ſufficient to prove, that the principal Intention of Nature, by this Evacuation, is not barely to prevent or keep down a Plethora of the Blood-Veſſels, and that the Conſequence of this Suppreſſion is not wholly or chiefly a Redundancy of Blood: And though they who think otherwiſe muſt be allow'd to account for it, as well as they can, yet I am clearly and fully perſwaded, that no ſuch Hypotheſis can ever be confirmed by any practical Obſervations or Experience.

But I muſt not leave the Matter here; for it would not be ſufficient to ſubvert or ſet aſide a falſe Hypotheſis, without ſubſtituting ſomething better in its Place.

I affirm therefore, that in this Evacuation, beſides the Blood which is deriv'd from the Arteries, there is likewiſe another very different and independent Secretion, or a Derivation of a certain excrementitious and redundant Lymph or Serum, from the membranous Cells and Ventricles of the Glands in general, but chiefly from thoſe Parts of the Membrana Celluloſa, which are more directly and immediately connected with the Kidneys, Uterus, and Ovarium.

WHEN the Menſes ſucceed well, and are diſcharged at the proper Intervals, and in due Quantities, the ſerous lymphatick Part of this Evacuation being deriv'd but in ſmall Quantities, and acquiring no ill Properties, differs but little from the common Lymph or Serum of the Blood, and is not eaſily diſtinguiſhed from it. But as ſoon as this Secretion becomes morbid, and is made in preternatural Quantities, with bad Qualities and ill Symptoms attending it, it then plainly appears to be a Matter very different from common Lymph or Serum, and evidently diſcovers a conſequent glandular Fermentation and Corruption. And in this Caſe it receives the Name of the Fluor albus, a Diſeaſe commonly known, and but too ſeldom cured.

AT firſt, only theſe Parts of the Membrana adipoſa which belong to the Loins, Kidneys, and uterine Appendage, are affected with it, and gradually waſted and conſumed by it; but in long run, the Inflammation of the Parts ſtill increaſing, and the Humour ſtill acquiring a greater Acrimony and eroſive Quality, all the Fat of the Body may be gradually fuſed, melted down, and carry'd off in this way. And this frequently happens in Fact, while the Blood at the ſame time continues in its natural

State, and diſcovers no Diſcraſis, Intemperature, or ill Properties, whenever ſo nicely examin'd, after Bleeding.

Now when we ſee in this Diſeaſe the Fat firſt of the Uterus and its Appendages is diſſolv'd, fuſed, and corrupted, which is gradually propagated farther through the Membranes in general, while the Blood retains its natural State, or not ſenſibly altered; if any one after this would contend that the Matter of this morbid Secretion is the natural Serum of the Blood, diſcharged together with it, I think no Man ought to be much concerned about ſuch an Adverſary, or be at any Pains for his Conviction.

I have elſewhere, in the ſecond Edition of my *Philoſophical Principles of Medicine*, Part II. Prop. 12. prov'd at large, that this lymphatick Secretion from the Ventricles of the Glands, and Cells of the Membrana adipoſa, is in common to all the natural Evacuations, as well as to that of the Urine; and to this I muſt refer the more learned and curious Reader. But I could not forbear ſaying thus much here, becauſe it naturally came in my way, was neceſſary to the Point in Hand, and may poſſibly fall into the Hands of ſome who had not ſeen the other Book.

HAVING mentioned this common and troubleſome Diſorder, I ſhall ſet down what I have found moſt ſafe and effectual for the Cure. But in the firſt Place, I muſt freely declare againſt all thoſe Glutinants and Aſtringents, which are pretty commonly uſed in this Caſe, but can never anſwer the true Intention of Cure, how much ſoever they may be extoll'd and cry'd up to this Purpoſe. Indeed the Fluor, by ſuch Means, may be ſtopt for a time, and the Patient flatter'd with a vain Hope of Recovery; but this Satisfaction laſts not long, for the Matter being hereby only reſtrain'd, and lock'd up, but not carry'd off, and the Stomach and Bowels at the ſame time heated and conſtringed, the Conſequences of it are often fatal, and never beneficial. And of this I might give ſeveral Inſtances, where the Diſeaſe, by ſuch a Management, has been made deſperate, and the Patient reduced to the moſt deplorable Circumſtances imaginable; but the Reaſon of the thing here is ſo very plain, that what has been ſaid, may be ſufficient to deter all young Phyſicians from ſuch a Practice, though otherwiſe what they may meet with in Diſpenſatories and Practical Writers, might be ſufficient to tempt them to it.

THERE is one Aſtringent, indeed, which though not commonly reckoned under this

Claſs, has a true and great Efficacy in ſuch Caſes, and will ſometimes perfectly cure any ſuch Flux, or ſeminal Weakneſs and Waſte. What I here mean, is the Tincture of Cantharides, given in a pretty ſtrong Decoction of Guaiacum. This will ſometimes prove effectual, without any farther Trouble; but it cannot be depended on alone, where the Caſe has been of long ſtanding, and diſcovers any great Putrefaction and Corruption of the Matter diſcharged; but if the Diſeaſe is inveterate, Recourſe muſt be had to Mercurials. Any other Method would be but palliative at beſt, and only tampering with an Enemy that ought not to be trifled with.

When the Uſe of Mercurials is required in this Caſe, there can be no need of the ſtronger Sort at all, not ſo much as of the Calomel, or Mercurius dulcis, which are the mildeſt Preparations of Mercury, where it is intimately mix'd and incorporated with Salt: But ſuch Preparation of Mercury may give it too great a Force and Stimulus upon the Solids, in very weak and tender Conſtitutions; ſuch are moſt of our Patients under this Diſorder. And therefore, to this Purpoſe I prefer the ſimple crude Mercury, which may be ſo given and directed, as not to occaſion any Salivation, or require the leaſt Confinement; and yet when ſo managed from its own Nature, and friendly Efficacy, the Succeſs may be depended on, as I have always found.

THE common Method in this Caſe, with thoſe who give Mercury at all, is to give the Calomel or Mercurius dulcis with ſomething purgative, or to exhibit the Mercurial over Night, and the Purgative next Morning: But this Method cannot be borne by Perſons of a tender Fabrick; and beſides, it weakens the Stomach and Viſcera, hurts the Digeſtion, and takes off the Appetite in Patients of the beſt and ſtrongeſt Habits. The Reaſon aſſign'd for ſuch a Method in common Practice, is to keep down the Mercury, and prevent a Salivation: But even in this Caſe, ſuch Practitioners are very often deceiv'd, and a Salivation is brought on, by the very Means which are made Uſe of to prevent it.

BUT where this is the Intention, it would be much better to give the Mercury in ſmaller Doſes, and ſuſpend the Uſe of it now and then for a few Days, when there are any Appearances of a Salivation coming on, till thoſe Symptoms diſappear. By this Means, almoſt any Intention of giving Mercury might be obtain'd, without ſalivating at all; whereas continued Purging, for any conſiderable time, by relaxing and weakening

ing the Stomach, and deſtroying the Appetite, muſt do more Hurt than any Medicine can do Good. But I think the Method which I have before propoſed for giving Mercury, as crude, is preferable to all others; and has this great Advantage, in that as it may be raiſed high enough for the ſtrongeſt Conſtitution, ſo it may be accommodated to the weakeſt, and has leaſt Danger or Inconveniency attending it, in all Caſes whatever.

I AM ſatisfy'd, that no good or beneficial Properties accrue to Mercury, by any of the Chymical Preparations of it with Salts and Acids, and cannot imagine to what Purpoſe Men ſhould be at ſo much Coſt and Pains to find out and prepare ſo many different Sorts of Poiſons, only to ſhew their Skill in uſing them, without directly poiſoning their Patients. But 'tis much eaſier to make a Poiſon, than to aſcertain the ſafe and beneficial Uſe of it; and much better to find out a Medicine that will be ſafe and innocent at firſt, than to find an Antidote againſt a very rough and dangerous one.

THE Method which I have propoſed of giving Mercury, as it is the moſt benign and friendly to Nature, ſo is of the moſt univerſal Uſe, in all thoſe chronick and obſtinate Diſeaſes, which are brought on by the preternatural Viſcidity of the Blood and Humours; and eſpecially in hypochondriack and hyſterick Diſorders, when all other Remedies fail: Nor can any thing be more certainly depended on, for procuring the natural Flow of the Menſes, in any obſtinate Obſtruction of that Kind, where the common Uterines will have no Effect.

FROM all this, it may be concluded, that if the natural Evacuations were deriv'd only, or chiefly from the Blood-Veſſels, and if there were no conſiderable Secretions independent of this, bleeding muſt be of the moſt extenſive and univerſal Uſe, and muſt upon this Hypotheſis, anſwer the End of almoſt any other Evacuation, where-ever there is a Plethora of any Kind. Phlebotomy, in this Caſe, muſt be the moſt certain and approv'd Method of removing Obſtructions in general, or to prevent the ill Conſequences of them, from the increaſed Quantity of Blood occaſioned by ſuch Obſtructions: But yet the quite contrary to this is evident in Fact, from all Experience; and whatever Men may imagine or maintain in Hypotheſis, no good Phyſician can practiſe upon it; nor perhaps, has there been any Hypotheſis ever advanced, which has coſt more Lives, or been the Ground of ſo much Male-practice, as the *Bellinian* Doctrine of Secretions, while he deriv'd them all from the Blood in the Arteries, and knew no other Communication, or Way of deriving them. But I think this is now better underſtood, or at leaſt I muſt ſubmit my Obſervations and Reaſonings upon it, to the Judgment of the Learned.

In thoſe influent or nervous Fevers, as they are call'd, which have been ſo Epidemical among us for ſeveral Years paſt, I am very ſure that the Bleeding Method has prov'd greatly detrimental and pernicious, within my own Obſervation, and ſo far as I have been able to inform myſelf from the Accounts of others.

In ſeveral Parts of *Glouceſterſhire*, *Somerſetſhire*, and *Wiltſhire*, about four Years ago, it was a melancholy Scene to look upon the common Slaughter and Deſtruction of almoſt whole Pariſhes, none of whom died for want of *Bleeding*. Bliſtering and Sweating, when uſed in time, ſucceeded well, but they who were bleeded freely, or in any conſiderable Quantities, which was the common Caſe, either died in a few Days, or elſe were thrown into ſuch lingring chronick Diſorders, as were more difficult to cure, and therefore of worſe Conſequence than the Fever itſelf. This is a plain and moſt notorious Matter of Fact; and therefore, they who will take no

Warning, but being poſſeſs'd with a falſe Hypotheſis, will reſolutely perſiſt in this Method, in ſpite of all Reaſon and Experience to the contrary, can be look'd upon as no better than *Homicides.*

WE ſee from daily Experience, that where the Fat of the whole Body has been waſted and waſh'd off by Fevers, or other Accidents, and the Perſon reduc'd to a mere Skeleton, and to leſs than half his former Weight; this may be all recruited again, and brought to as good a State as before, in a little time, provided that ſuch Conſumptions and Waſts of the Fats have not been owing to any ſcorbutick Taint, or putrifying Malignity fix'd upon the Membrana adipoſa. But where it happens that a Perſon, upon any Occaſion whatſoever, has ſuffer'd any great Expence or Loſs of Blood, it is never recruited or reduced to its natural Warmth, Strength, and Vigour, as before; as Multitudes can teſtify, who have been liable to ſuch unhappy Accidents. And therefore I ſhould make it the Matter of my Advice and Requeſt to all younger and leſs experienced Phyſicians, *To be ſparing of human Blood; ſee an abſolute Neceſſity for it, before you ſpill it; let not its Innocency lie at your Doors, and cry to Heaven for Vengeance, but ſtudy to find out Expedients for it, and Methods of Cure, without ſhedding*

ding of Blood. This I am ſure may be done in moſt Caſes, as I ſhall endeavour to prove more at large in another Place.

And in the mean while, it may be worth conſidering, whether the *Bellinian Hypotheſis* in this Caſe may not be ill grounded, and whether it be adviſeable to ſtick to it, from a Preſumption, that if the Practice upon this Foot ſhould not be right, nothing elſe can. This is certainly a Matter which ought to be well weigh'd, and every Man who can occaſionally ſtep out of his way, and talk pertly about what he does not underſtand, and has never ſufficiently conſider'd, ought not to be too forward in making the Deciſion.

Having had Occaſion, in theſe Sheets, to recommend the Uſe of Opium, under ſome of the greateſt Diſtreſſes of Nature, in a Manner very different from the common Practice; it may not be amiſs here to conſider the Nature and Uſe of this Drug, a little farther. For the Theory of it, and by what Mechaniſm it comes to have ſuch wonderful Effects upon animal Bodies, I muſt refer the more curious and inquiſitive Reader to what I have advanced upon it, in the *Philoſophical Principles of Medicine.* But I ſhall here take notice only of what is purely practical, relating to it. This noble, truly natural, and univerſal Cordial, yielding ſuch a certain and almoſt incredible Relief under the greateſt Pains and Depreſſions, to which we are liable; it has exerciſed the Skill of ſeveral of our beſt practical Phyſicians, to contrive it into various Forms and Compoſitions of Medicine, ſuch as might beſt anſwer the different Caſes and Intentions for which it is given. From the different Opinions of Phyſicians about it, and the different Caſes they have met with in Practice, there is hardly any one thing in the whole *Materia Medica* that has been order'd and directed under more different Forms: And indeed, there is ſcarce any great Diſtemper incident to Mankind, in which this muſt not often be call'd in, and made the Mediator between Nature and the Diſeaſe, while the War continues.

THE moſt common Preparations of it kept in the Shops, are thoſe following; Diacodium, Diaſcordium, Mithridate, Venice Treacle, *Sydenham*'s Liquid Laudanum, the Philonium Romanum, the Pill de Styrace, *Mathew*'s and *Starkey*'s Pill.

THE *Diacodium* is commonly ordered for Children only, or to ſweeten Juleps, where no great Force of a Opiate is required. This is the mildeſt Opiate of all, and the Nature and Uſe of it is ſo commonly ly known to every Nurſe, that I need not ſay any thing farther about it.

DIASCORDIUM. This has a great Reputation, as an Aſtringent, and is commonly directed in Diarrhœa's, Fluxes, and all great Relaxations of the Stomach and Viſcera: And yet upon the whole, it is but an indifferent Medicine, and not much to be depended on under ſuch Symptoms, when they are very urgent. The only thing that can be depended on in this whole Apparatus, as to the main Purpoſes for which it is deſign'd, is the Opium; of which there is not quite one Grain in five Drachms of the Compoſition: That is, the only thing of certain Efficacy in it, does not make $\frac{1}{300}$ Part of the Medicine.

THE Honey which here makes about a ſixth Part of the whole, is directly contrary to the main Intention; and the Boles or Earths, though they are Aſtringents, yet as they always clog and foul the Stomach, are not fit to be given in Medicine at all. In ſhort, there is no Caſe under this Intention, but might be infinitely better anſwered by an extemporary Bolus, conſiſting of Serpentaria, Cinnamon, and Tormentile Roots, with ſuch a Quantity of Opium as the Symptoms require, and of which the Phyſician muſt be Judge.

MITHRIDATE. This is a much better Medicine for the ſame Intentions than the Diaſcordium. The Proportion of Opium in both is much the ſame; and though it be here a little more, yet the Difference is ſo ſmall, that it is not worth regarding.

VENICE TREACLE. This is a much better Medicine than either of the foregoing, though perhaps for no other Reaſon in the World, but for having a greater Proportion of Opium in it; which is here about $\frac{1}{8}$ Part, or 1 Gr. in 94 of the Compoſition.

LIQUID LAUDANUM. That which is commonly kept in the Shops, is Dr. *Sydenham*'s Preparation of it, in which there is a Solution of ℥2. of the Opium in a Pint of Wine. Conſequently if there was a perfect Solution of the Opium, $\frac{1}{9}$ Part of this Tincture muſt be Opium: But Experience teſtifies, that one Grain of good Opium is as much in Effect as 20 Drops of this Laudanum.

PHILONIUM ROMANUM. This is the warmeſt Opiate in common Uſe, or that is even kept in the Shops; and for that Reaſon, much the beſt, under ſeveral great Intentions, as we ſhall ſee afterwards. There is one Grain of Opium in ʒ*ſs* Gr. 5. of this Compoſition.

MATHEW's PILL. About $\frac{2}{9}$ of this Compoſition is Opium. The Soap of Tartar here makes it a very good Diuretick, as well as an Opiate; and therefore it is well directed in Stranguries, Diſuries, and all Caſes under a Suppreſſion of Urine; and where Opiates, upon other Conſiderations, may be required. But in this Caſe, *Starkey*'s Pill is a much better and more judicious Compoſition, though it is not ſo commonly kept in the Shops: And where this is ordered, 'tis more than twenty to one that the other being always ready, will be put up inſtead of it. And therefore 'tis great Pity that *Mathew*'s Pill was not quite laid aſide, as a Shop-Medicine, and this of *Starkey* ſubſtituted in the room of it, and always kept in Readineſs. The Proportion of Opium in it is ſomewhat leſs than the other, as being about a fifth Part of the whole.

I HAVE mentioned thoſe opiated Medicines, only for the ſake of the principal Ingredient in them, which is the Opium itſelf. This is the only thing which has given them ſuch a Repute, and brought them into common Uſe; and abſtracting from this, they are moſt of them but very indifferent Contrivances, which might be much better anſwer'd in extemporarious Practice, from a very few Simples of known eſtabliſh'd Efficacy in particular Caſes, and which are always kept in the Shops. And therefore, it will be more to the Purpoſe to conſider the Nature and Uſe of Opium itſelf, with Regard to the ſeveral good or ill Conſequences to be expected from it, and the true Method of correcting it under the different Circumſtances of its Operation.

BESIDES the common Principles of Water, or Phlegm, and Earth, with a ſmall Proportion of eſſential vegetable Salt, which enter into the Conſtitution of all Vegetables; Opium, as the chymical Analyſis of it ſhews, abounds with two very different ſorts of Oil; an ætherial volatile Oil, and a ponderous, adheſive, and reſinous Oil; which when ſeparated from its volatile Oil, and from its Earth and Phlegm, with which it is qualify'd, becomes corroſive, and affects the Stomach and Viſcera with Spaſms and Convulſions, like all the other fix'd, ponderous, and corroſive Oils of Vegetables.

IN the natural Conſtitution of this Drug, the volatile Oils and Salts are ſo admirably mix'd and blended with its fix'd, adheſive, and ſtimulating Oils and Salts, as to give the higheſt Delight and Pleaſure by its Action upon the Nerves. In Conſequence of which, it qualifies and reduces any exorbitant Paroxyſms or Outrage of the nervous Syſtems, and thereby reſtores the Æquilibrium of muſcular Motion, by a Law of animal Mechaniſm; which I have ſufficiently explain'd in my *Philoſophical Principles of Medicine.*

Opium therefore, in general, contains its own Correctors; and under all great Depreſſions, affords us the nobleſt, warming, and reviving Cordial in the whole Univerſe, where the nervous Syſtem is rightly conſtituted, and the *Solids* have not been much hurt by the irregular Motions, and preternatural Affections of the *Fluids.* But in diſeaſed Conſtitutions, in its over Doſes, and in the too long and habitual Uſe of it, it may be attended with very bad Conſequences, and in ſome Caſes, prove even a true and genuine *Poiſon.* For which Reaſon, it muſt be highly neceſſary for every Practitioner in Phyſick to be well appriz'd of the different and various Circumſtances, under which it will do either Good or Harm, and to know how to correct it, and prevent the farther Miſchief, when by any Accident it has been injudiciouſly uſed, or wrong apply'd. I ſhall here therefore, as briefly and clearly as I can, repreſent the Caſe ſuch as I know it to be, both from Reaſon and Experience, or from the Nature of the thing itſelf, and the Obſervations I have made upon it in Practice.

I HAVE obſerved above, that the peculiar Efficacy and Effects of Opium, depend upon two of its conſtituent Principles; namely, an exceeding light, ætherial, and highly volatile Oil or Spirit, and a ponderous, adheſive, ſtimulating, and corroſive Oil or Reſin. This adheſive corroſive Oil, when ſeparated from its volatile Parts, and from its Earths and Phlegm, is a true and proper Poiſon, and affects the Stomach and Viſcera with an Eroſion and Gangrene, or Mortification, like all other Poiſons.

ON the contrary, the volatile ætherial Oil or Spirit of Opium, affects the nervous Syſtem, and the animal Fluids, though in a higher Degree, yet after the ſame Manner with all other volatile vegetable Oils, or vinous Spirits: And though it has nothing adheſive or ſtimulating in it, yet by the extreme Subtilty and Volatility of its Parts, it excites a warm vigorous Efflatus in the Stomach and Viſcera, and by their conſequent Diſtention in, and Preſſure upon the deſcending Arteries, drives the Blood in a greater Quantity and Proportion than uſual, to the Head and ſuperior Parts, which derive their Blood from the aſcending Trunk of the Aorta. Now from hence it is plain, that either of theſe conſtituent Principles alone, or when ſeparated from its native Corrigents, muſt be attended with very bad Conſequences, and might bring on Death, tho' in different ways, and by quite contrary Effects. The adheſive, reſinous, and corroſive Oil, by its too powerful Stimulus, erodes the Stomach and Viſcera, derives the Blood and Humours in exceſſive Quantities to the ſtimulated Parts, and thereby occaſions an Inflammation, Eroſion, and Gangrene in the inferior Parts, while the Head and ſuperior Parts are left deſtitute of Blood, Life, and Motion, and the Perſon dies under an external cold Horror, while the Stomach and Bowels are highly inflam'd, and burn like Fire.

On the other hand, where any volatile vegetable Oil, or vinous Spirit proves mortal, the Perſon dies lethargick, and under aſthmatick Suffocations, attended with a ſtrong, full, and large Pulſe, a ſlow heavy Reſpiration, deep Sighs, high Colour, warm Sweats, and a vigorous Efflatus of the Blood. And theſe Symptoms continue till the mortal Spaſms and Convulſions approach towards the laſt Moments, and then the natural Heat retires, together with Life itſelf.

I HAVE here deſcrib'd theſe two oppoſite morbid Conſtitutions, under the very Moments of Death itſelf, becauſe it will ſerve not only to explain the Nature and Uſe of Opium, and how under different Circumſtances it ought to be corrected; but likewiſe almoſt of every other Medicine; eſpecially in Fevers, as they happen to fix chiefly either upon the Head and Brain, or upon the Stomach and Bowels. Thoſe two Conſtitutions in general, may be call'd the effluent and influent State of Diſeaſes; which is of ſuch infinite Conſequence in Phyſick, that ſcarce any thing can be done without the due Knowledge of it, and a careful Regard had to it from time to time, as the Symptoms may vary, or be differently complicated: But this is a Subject which I cannot purſue now, and therefore muſt return to the Buſineſs in hand; the Nature and Uſe of *Opium.*

WHEN a moderate Doſe of Opium is given under proper Circumſtances, the Conſequences are ſuch as theſe: Firſt, the Perſon ſoon after taking it, feels a warm invigorating Senſation and Emotion throughout the whole nervous Syſtem or animal Frame. Upon this the Pulſe riſes, the natural Heat expands and diffuſes itſelf outwardly; a warm breathing Sweat appears, any preceded Coldneſs, Laſſitude, or Depreſſion vaniſhes, and the Perſon is more active, lively, and vigorous than before.

This Fluſh, or Efflatus of the Blood and Spirits, having laſted about five or ſix Hours more or leſs, goes off, and is then ſucceeded with a certain Torpor, and Contraction of the Eye-lids, a liſtleſs Indolence, and a general Huſh or Calm of the Senſes, diſpoſing to Sleep. And as Sleep could not be obtain'd before, ſo it is now unavoidable, unleſs the Patient be kept awake, whether he will or no.

If a larger Doſe be taken, it procures a ſort of Drunkenneſs for the preſent, or ſuch a confuſed Emotion of the Blood and Spirits, as prevents Sleep for ſeveral Hours, as before; but then the ſucceeding Sleep will be the more deep and laſting.

The Doſe ſtill raiſed higher, ſo as to procure Sleep immediately, or in a very little time, will hardly go off without ſome troubleſome and frightful Symptoms, if it does not end in a Lethargy, and Death itſelf. But in this Caſe, the native Generoſity of the Medicine, often eludes the Ignorance of the Preſcriber. For before the volatile ætherial Oil, or Spirit of the Opium, can have this mortal lethargick Effect upon the Head, its ponderous adheſive Oil begins to act upon the Stomach, and by the Power of its Stimulus, bringing the Stomach into ſtrong Contractions, and ſpaſmodick Emotions, the Doſe, which muſt have been otherwiſe deadly, is thrown up by Vomiting. Of this I have known ſeveral Inſtances.

A NOBLE Lady not many Years ago, under a Diſguſt, took a large Doſe of Liquid Laudanum, with a Deſign to have given her Lord no further Trouble; and though ſeveral Phyſicians were immediately call'd in upon the Occaſion, yet their Pains were very much ſpared; for the Lady vomiting with her own Preſcription, ſoon recover'd, and did very well.

THE Caſe of the famous and juſtly celebrated *Jonathan Wild*, is commonly known; who, the Night before his Execution, took an extraordinary Doſe of this ſoporiferous Reliever of Nature, with a Deſign to have ſpared the Hangman his Labour: But the generous Medicine proving emetick, and throwing itſelf off, by Vomiting, ſaved the Criminal for the Hands of that lingring and ſlow-paced Juſtice, which had been long waiting for him. Such is the generous Conſtitution of this benign Drug, that it is hardly poſſible, under natural Circumſtances, to kill one's ſelf with it. And where it does Miſchief, it is for the moſt part by giving it under ſuch Circumſtances, in which it ought not to be taken at all, as will afterwards more plainly appear. But from what has been here obſerved, 'tis certain, that they who give Opiates towards Bed-time, to procure Reſt in the Night, muſt needs miſs of their Aim, as they really do in Fact; for till the invigorating Power of the Opium is ſpent, its ſoporiferous Quality takes no Place, as all Experience teſtifies. But 'tis impoſſible, in this Caſe, to make Opium take ſuch a ſudden Effect, unleſs Men would give ſuch large Doſes of it, as they might not, perhaps, afterwards know how to manage. And therefore, where it is intended to procure Sleep or Reſt, the compoſing Medicine ought to be taken five or ſix Hours before-hand; and conſequently, inſtead of giving compoſing Draughts late in the Evening, or about Bed-time, they ought always to be given early in the Afternoon.

FROM the pleaſurable Senſation which Opium gives to the nervous Coats of the Stomach and Viſcera, join'd to its expanſive rarefying Power, in diffuſing the natural Heat, raiſing the Pulſe, and bringing out the critical breathing Sweats; it becomes the moſt ſovereign certain Relief, under all great Depreſſions, Languors, and Deliquia, in all Diarrhœa's, Hemorrhages, and Fluxes, and in all windy flatulent Cholicks, and ſpaſmodick Contractions of the Stomach and Bowels: In which Caſes it ſeldom fails, when given in due Doſes, and carefully attended to, till the Intention be anſwered.

BUT it is not here to be ſuppoſed, that plain Opium, without any farther Trouble or Apparatus, will always anſwer theſe Intentions. The Manner of giving, and the Method of correcting it, under the ſeveral Circumſtances of its Operation, is the principal thing to be regarded, and which I come now to conſider. What the true and genuine Effects of Opium itſelf are, under a natural State of the animal Oeconomy, and where the Solids by any conſtitutional Diſorder, have not been much hurt by the Fluids, I think I have ſo plainly deſcrib'd, that no Body can well miſtake the Matter: But yet there are ſeveral morbid Habits or Conſtitutions of the animal Body, that will verymuch diverſify the Operation of Opiates, and certainly elude all the Expectations of the Preſcriber from them, if he be not very careful in his Inquiries about it.

NOW here I have ſeldom obſerv'd the common Queſtions that are ask'd of the

Patient, in ſuch Caſes, to be very much to the Purpoſe; and therefore, if I can but explain the Matter, ſo as to be rightly underſtood, I ſhall think I have done the Publick at leaſt ſome ſort of Service.

The effluent and influent Conſtitution of Diſeaſes, eſpecially of Fevers; which I have juſt now taken notice of, elſewhere more fully explain'd, is a thing of the greateſt Conſequence, and moſt worthy of Attention in this Caſe.

The true and genuine Property of Opium, is to diffuſe the natural Heat, to raiſe the Pulſe, and to increaſe the *Momentum Motus* of the Blood, in all the aſcending Branches of the Aorta. And this being the proper natural Effect of its volatile ætherial Oil or Spirit, which begins to act almoſt as ſoon as it is receiv'd into the Stomach, is the firſt and moſt remarkable Appearance or Phænomenon upon taking of it. But where there is any precedent Plethora, either conſtitutional or accidental, in the *Head* or *Lungs*, and whether this Plethora be of the Blood or Lymph; ſuch a quick and ſudden Diffuſion of the Blood, and increaſed Momentum toward the Head, will be attended with ſome ill Symptoms; ſuch as *vertiginous Confuſion, Head-ach, troubleſome Heats, difficult Reſpiration, reſtleſs Watching,*

ing, or very *diſturb'd Sleep*, &c. It would be tedious to reckon up all the Symptoms that may ariſe upon ſuch an Occaſion, but the Cauſe being thus evident, any one may eaſily perceive what the Conſequences will be. The beſt Rule therefore to be obſerv'd here, is not to give Opiates at all, if it can be avoided; but where there is an abſolute Neceſſity for it, upon other Accounts, as it often happens, the foregoing ill Effects of it may, in great meaſure, be prevented, by correcting the Opium with ſome *Acid*: For in this Caſe, I affirm Acids to be the true and only Corrigents of the Opium, ſo as to prevent its ill Effects upon the *Head* or *Lungs*, where there is any preceding Plethora in either of theſe principal Seats of Life and Motion. It would be tedious and uſeleſs, to reckon up all the Expedients, which have been contriv'd and propos'd by *Practical Writers*, in ſuch Caſes; and therefore I ſhall only ſay, that upon Trial I have always found myſelf diſappointed in them, as I preſume every Body elſe muſt. And any one, who has the leaſt Acquaintance with animal Mechaniſm, muſt eaſily ſee that Acids are the true and natural Corrigents of the volatile ætherial Oil or Spirit of the Opium, where it is likely to have any ill Effects upon the Head or Lungs, from the Cauſes already aſſign'd.

Now here I commonly chuſe ſome of the ſtronger mineral Acids, more or leſs qualify'd and diluted, according to the Nature of the Caſe; which have this Advantage, that they may be given in ſmall Quantities, and conveniently taken with the Opiate itſelf in any Form: For I take it to be an eſſential Rule or Principle of all good Practice, never to clog the Patient's Stomach, or load him with Medicines, either under many Forms, or in very large Quantities; which is often pernicious, and never uſeful: Nor is this ever done, but where ſomething elſe is conſulted, beſides the Health and Benefit of the Patient himſelf, unleſs it may, perhaps, ſometimes happen from the over Forwardneſs, or too buſy Ignorance of the Phyſician.

But to return: There is another Caſe quite oppoſite to the former, in which Opium will very often need Correction. And that is, where its volatile ætherial Oil or Spirit has no ill Effects at all upon the Head or Lungs, but on the contrary, is very grateful and reviving; yet as ſoon as the Force of this is a little ſpent, its ponderous, ſtimulating, and adheſive Oil comes to act, and produces Sickneſs, Nauſea's, Vomitings, Spaſms, flatulent Cholick Pains, and ſuch like ill Symptoms, upon the Stomach and Bowels. And here, as the Cauſe is contrary, ſo it muſt be prevented or remov'd by a very different Method: For in this Caſe, inſtead of Acids and cooling Reſtringents, the warmeſt Alexipharmicks muſt be uſed; ſuch as *Engliſh* Saffron, *Virginian* Snake-Root, Contrayerva, Zedoary, Cloves, *&c.* but above all Camphire, which is the trueſt and moſt genuine Corrector of the adheſive ſtimulating Oil of the Opium, in the whole World.

BUT where Opium is ever ſo natural or agreeable to a Conſtitution in general, ſo as to require no Correction in taking it, yet the continued habitual Uſe of it, will be attended with very bad Conſequences: For it gradually weakens and relaxes the Stomach and Viſcera, deſtroys the periſtaltick Motion of the Bowels, takes off the Appetite, leſſens all the natural Evacuations, and induces a preternatural Viſcidity of the Blood and Humours, with all the natural Effects of ſuch a morbid Conſtitution; and, which is the ſame thing, it introduces the Hyp, Spleen, and Vapours, with all the Symptoms of a radicated Scurvy.

I WISH it could be ſaid for the Honour of our Country, that theſe Diſorders are very rare among us, and only brought in now and then by an immoderate Uſe of

Opiates. But this ſeldom happens in *England*, though I have ſometimes known it: And yet it muſt be own'd, in the Face of the Sun, that we are the moſt hypochondriacal, hyſterical, or ſcorbutick People under Heaven. And this, not as the Effect of Opium, which would indeed be better than any other heating rarefying Oil or Spirit; but as the natural genuine Conſequence of *Eaſe*, *Indolence*, *Intemperance*, *indulged Pleaſure*, irregular Gratifications of the *natural Appetites*, and with the Want of *open freſh Air*, and *habitual Exerciſe*.

THESE are the true mechanical Cauſes of all our national conſtitutional Complaints, of our growing Weakneſſes, increaſing Scurvies, and the moſt obſtinate, chronick, and hereditary Diſeaſes fixing and radicating themſelves ſtill more and more upon our natural Habits and Conſtitutions. From the foregoing Cauſes, the natural Evacuations having been obſtructed and diminiſh'd, the ſecreted Humours thicken'd, and render'd viſcous, adheſive, and clammy; and the Solids, eſpecially the nervous Syſtem, hereby weaken'd and relax'd; the Fluids, in this Caſe, muſt neceſſarily contract ill Qualities, and become hot, ſharp, ſalt, and corroſive. And this hot, ſharp, corroſive Serum, where-ever it is thrown, or happens to be depoſited, muſt erode and ulcerate the Solids, and induce all the Symptoms of a true and genuine Scurvy. And this Name it geneeally receives, and is known by, as often as it is thrown outward in Spots, Pimples, a ſcaly leprous Scurf, and other ſuch ſcorbutick Irruptions upon the Skin: But when it happens to prove influent, and is thrown upon the Liver, Meſentery, Kidnies, Stomach, Viſcera, Lungs, or any internal Part, it paſſes under the more faſhionable and reputable Names of the Spleen, Vapours, Conſumption, Jaundice, Gonorrhea, Fluor Albus, *&c.* But as this is ſtill the ſame thing, under a worſe Circumſtance, I muſt give it the ſame Name, and aſſign the ſame Cauſes.

HAVING thus occaſionally mentioned this obſtinate and moſt prevailing Diſeaſe, I cannot leave the Subject, without ſome farther Obſervations upon it, now I am in the way of Digreſſion.

THE common Preſcriptions, and medical Proceſſes, in ſuch Diſorders, conſiſt of the hot pungent Bitters, infuſed upon ſtrong Wines, the volatile Oils and Spirits of Vegetables and Animals, the Tinctures and Infuſions of Caſtor, Saffron, Serpentaria, Contrayerva, Cochineal, and the like; Chalybiates, Opiates, and different ſorts of Drams, heated and raiſed ſtill higher with the volatile Oils, Spirits, and Salts. But ſince this original morbid Conſtitution itſelf, as I have obſerved, conſiſts in the Tenacity and Viſcidity of the Blood and animal Fluids, occaſioning a Diminution of the Secretions, and a conſequent Diſtenſion and Relaxation of the Nerves; 'tis plain, that the foregoing heating rarefying Method, by aggravating all the Symptoms, muſt ſtrengthen the morbid Habit, and confirm the Diſeaſe ſtill more and more.

It is true, indeed, that this wrong Practice may be ſometimes owing to the Ignorance and Obſtinacy of the Patients themſelves, who when they are under great Depreſſions, or in Pain, are glad of, and thankful for a little preſent Relief; though they are the worſe for it afterwards. And this happening to fall in with the Intereſt of the Phyſicians, it is commonly comply'd with; and the Patient kept on from Year to Year, living and dying by Turns. But what I have here frequently obſerv'd, with great Indignation in ſome Practitioners, is this, that while they ſtrictly forbid the Uſe of all ſtrong malt Liquors, Wine, and common Drams, they are continually loading their Patients with Preſcriptions of the ſame kind, out of the *Shops*, which are not at all better, and very often much worſe. But certainly the Shops in this Caſe are only emptied of theſe liquid Fires, to enrich the Phyſician, to fortify and ſtrengthen the Diſeaſe againſt Nature, and to multiply every *ſingle Devil* into *ſeven*, for the more effectual Poſſeſſion of all future Generations. And yet 'tis commonly thought, that ſomething of this Nature ought to be done as long as an indolent uſeleſs Creature is willing to live, and has but Money to fee a Phyſician, while perhaps Death might be a Bleſſing to the Patient, and to the reſt of Mankind, and Nobody would ſuffer by it but the Doctor. But People having in this manner worn out Life to its bare Threads, are often ſet upon Riding, Change of Air, Bathing, and Water drinking, at ſome diſtant Mineral Springs; where they may die decently, as having then uſed the laſt Remedies, which ought to have been the firſt. From this wrong Method it is, that chronick Diſeaſes are ſo ſeldom cured, and that the Scurvy prevails againſt the Phyſicians, like the Devil againſt the Clergy.

BUT when the Matter comes to be better underſtood, it will appear that this Kind is never diſpoſſeſs'd, but by the mercurial Deobſtruents, the cooling Bitters, Sweating now and then under a proper Regimen, hot and cold Bathing, as Nature directs, diluting with proper Liquors; and all this join'd with open freſh Air, and Exerciſe, eſpecially Riding.

But I muſt take another Opportunity to ſet this whole Proceſs in a clear Light, as having now only mentioned it by way of Digreſſion. But however, with regard to the mercurial Deobſtruents, upon which the greateſt Streſs is to be laid in the pharmacutick way, I think myſelf obliged to communicate a Medicine, which I have found very ſucceſsful, and which, for its Efficacy and Safety, I take to be one of the beſt of its Kind.

> ℞ *Mercurii vivi* ℥ij. *Terebinth.* ʒij. *vel quantum ſufficit ad Mercurii fixandum. Cui adde, Rhab.* ℥jſs. *Cochin.* ℥ſs. *& cum Elix. pp. q. s. fiat Maſſa pilularis.*

The Mercury here not being united with Salts, may be ſafely given to the weakeſt Conſtitutions, without any Danger of hurting the Solids, or injuring the thin ſlender Coats of the Stomach and Bowels; which is the common Inconveniency of the ſaline Preparations of Mercury, under weak and tender Habits.

The Rhubarb and Cochineal, are moderately aſtringent upon the Stomach, Viſcera, and Urinary Paſſages; and as thus join'd and given with Mercury, they commonly prove an effectual, ſafe, and benign *Diuretick*; which is a principal Intention to be regarded and aim'd at, in all ſcorbutick Diſorders, whether the Diſeaſe be influent or effluent.

THIS Medicine will now and then, if left to its natural Courſe, take a Turn to Salivation; but very ſeldom, unleſs it be given in large Quantities, or too often repeated. But while this is taking, or indeed any thing elſe of like Nature, it is an excellent way for the Patient now and then to be moderately ſweated, by giving a Draught or Bolus to that Purpoſe, going to Bed, and plentifully diluting with Sage Tea, Sack Whey, or thin Water-Gruel, with a little White Wine in it, ſo as to keep up the Sweat for five or ſix Hours; or even ſometimes longer, where the Caſe requires it. The ſcorbutick Foulneſſes, and Recrements of the Secretions, being hereby determined to the cutaneous Glands, are eliminated and thrown off this way, much more expeditiouſly, ſafely, and effectually, than by Salivation.

THERE are indeed ſome Conſtitutions which cannot bear ſweating, or in which this Method may not be ſo proper upon other Accounts; but even here this Medicine itſelf is ſo very mild and benign, that when directed with the leaſt Judgment, there can be no Danger of any ill Conſequences in the Uſe of it. And if a Salivation from it ſhould happen, contrary to Intention, as it hardly ever will, yet even in this Caſe, the Force of the Mercury upon the ſalival Glands may be eaſily prevented, or reſtrain'd at Pleaſure, only by rinſing the Mouth pretty often in a Day, with a Solution of Camphire, in Oil of Olives.

I HAVE ſaid thus much, for the Sake of thoſe who know no other Uſe of Mercury, but to ſalivate with it; and to ſhew that it may be eaſily determined any way, with a very little Judgment and Diſcretion: Which is a Matter of ſuch Conſequence, eſpecially to Patients of a weak and tender Habit, and who cannot bear the common Methods of Salivation; that I hope this Digreſſion will eaſily be forgiven. I know, indeed, that the Mercury, when a Salivation is not intended, is often in common Practice carried off by repeated Purging; giving a mercurial Bolus over Night, and the Purgative next Morning; and this to be continued for a long time together. A Method ſo abſurd and prepoſterous, that they who give into it, muſt do it blindly, without knowing any thing either of the animal Oeconomy, or of the Nature and Uſe of Mercury. And if any one ſhould want a Reaſon for this, I think it could be to no great Purpoſe to attempt convincing him of any thing at all about the Practice of Phyſick.

PROPOSITION XVI.

To explain the Nature, Origin, and Cure of Childrens Diſeaſes; and of ſuch Diſorders in general, as are derived from our firſt Infancy.

IN order to judge the better concerning the Diſeaſes incident to Children, from their firſt Infancy, and the moſt rational Method of curing them, it will be neceſſary to trace theſe tender Creatures from their Original; and to conſider the Manner and Circumſtances of their Accretion, Nutrition, and Growth, from their Conception to the Birth.

THAT all Generation is from an Animalculum pre-exiſting in *Semine Maris*, is ſo evident in Fact, and ſo well confirm'd by Experience and Obſervation, that I know now of no Learned Men, who in the leaſt doubt of it.

In the human Kind, one of the largeſt of theſe ſeminal Animalcula, when view'd through a Microſcope that magnifies 680 times in Diameter, appears to be about a ſixth Part of an Inch; and therefore its real Diameter, when reduced to a Sphere or Globule, cannot exceed $\frac{1}{4000}$ Part of an Inch; and therefore the ſolid Content of one of theſe little People, is not more than $\frac{1}{120000000000}$ Part of a Cubick Inch. Now I ſhall here ſuppoſe a Child when firſt born to weigh ſix Pounds, which is a middle Size for Children that come to Perfection. And ſince the ſpecifick Gravity of ſuch a Body is very nearly the ſame with that of Blood, the ſolid Content will be 160 Cubick Inches, *quam proximà.* And from hence it follows, that the Bulk or Magnitude of an Infant at the Birth, is to the Magnitude of the ſeminal Animalculum, or the ſame Creature at the Moment of Conception, in the Proportion of 19200000000000 to 1. But the Logarithm of 19200000000000, is 13283801; which divided by 301030, the Logarithm of 2, gives 4412; and conſequently 19200000000000, is ſomewhat more than the 44th Power of 2, the natural mean Interval, from the Conception to the Birth, is nine Lunar Months, containing 266 Days. Now 266, divided by 4412, quotes 6: That is, the Growth, from the Conception to the Birth, is ſuch, that the Animalculum or little Creature doubles its Weight and Bulk every ſix Days, in a geometrical Progreſſion, for 44 Terms, which it compleats in nine Lunar Months, or 266 Days. Which is an Acceſſion and Growth ſo prodigious, that it muſt be altogether incredible, were it not an evident Demonſtration, grounded on plain Matter of Fact.

HOWEVER, it muſt not be thought that this Acceleration of Growth is uniform and æquable from the Conception to the Birth. For the Ratio certainly leſſens as the Embryo acquires a greater Bulk, and the laſt two Months ſeldom doubles the Weight. The Ratio of this Accretion of Matter ſtill leſſens, from the firſt Conception, to the full natural Growth ; and in Conſequence of this, the Body becomes more and more ſolid and compact ; or, which is the ſame thing, the oily concreſcible Fluids coagulate and indurate in the membranous nutritious Cells, where they are depoſited.

BUT from this ſurprizingly quick, and original Acceſſion of Matter, 'tis evident, that the Bodies of Infants, or Embryo's at firſt, and even to the Birth, muſt be almoſt all Fluids; and that the Compactneſs, Strength, and Firmneſs of an animal Body increaſes, as the proportional Acceſs of Matter leſſens, and this perhaps in a reciprocal Proportion; though the exact Ratio has not been yet determined, and 'tis probable, that this Ratio is not always the ſame, but very different, in different Subjects, and under different Circumſtances.

FROM this vaſt Acceleration of Growth at firſt, and the natural gradual Decline of it afterwards, as the Animal increaſes in Bulk and Weight, more certain Judgments might be form'd, concerning both the Indication and Cure, in ſuch Caſes, than from any other Principle, hitherto underſtood and explain'd.

THE vaſcular Parts of the Body will bear Stretching or Diſtention, but to a certain Degree; after which, if they are ſtretch'd or urged farther, having loſt all their Elaſticity, and being incapable of contracting and reſtoring themſelves, they muſt neceſſarily break, and let out their contain'd Fluids, or retain them only without Motion, like a ſtanding Lake, or ſtagnating Baſon, which is equivalent to an Evaſation.

THIS vaſt Acceſſion of Fluids at firſt, is neceſſary to anſwer ſeveral great Ends and Purpoſes of Nature, not here to be inſiſted on. But then a gradually ſlower and ſlower Acceſſion of Fluids, and larger Evacuations of them, will be as neceſſary afterwards, to increaſe the Strength, Compactneſs, and Elaſticity of the Solids.

DURING the time of Geſtation, the Fluids having been vaſtly accumulated, and the Solids and vaſcular Parts of the Body thereby ſtretched and diſtended, ſo far as they could well bear, the Priſoner now making a bold Effort and Struggle for Life and Liberty, is landed upon an unknown Shoar into a new World. And here let us conſider the Effects which the common Air muſt have upon a Body now freely and openly immers'd in it, after it had been cloſely ſtov'd up in a hot Bath, without Air or Breathing, for nine Months together. And it will be eaſy to imagine, that this Change muſt be like going directly and immediately out of a hot Bath into a cold one; which we know by Experience to be the moſt powerful thing in Nature, for conſtringing the Solids, recovering their Elaſticity, and promoting the Secretions or natural Evacuations. And beſides this, the Act of Reſpiration now taking place, the Velocity of the Blood muſt be very much increaſed; which contributes to the ſame Effect of augmenting the Secretions, and throwing off the Surcharge of Fluids; which having been collected in the time of Geſtation, for other Purpoſes then neceſſary, would be now exceedingly hurtful if not diſcharged. In ſhort, the whole Deſign of Nature now, is to increaſe the Strength and Proportion of the Solids, and to admit of no farther Supplies of Nouriſhment, but what may be neceſſary to this End. And to this Purpoſe, a ſlower Growth is abſolutely neceſſary, ſince a farther Accumulation of the Fluids in a Quantity and Proportion beyond what is requiſite for the Nouriſhment of the Solids, can only ſerve to increaſe the Weight and Bulk of the Body, without increaſing its Strength, and thereby to lay the Foundation of a very miſerable and ſhort Life.

Now from all this it is plain, that abating ſuch Accidents as cannot perhaps be foreſeen, or guarded againſt, one of the greateſt and moſt general Cauſes of the Weakneſſes and Diſeaſes of Children in their Infancy, is a too quick Growth, or forced Feeding, by which means, the Fat and Fluids being increaſed in an undue Proportion, muſt prove a uſeleſs Load, which the Solids will not be able long to ſuſtain. But we ſee Nature itſelf has taught the Brute Creatures a much better Way of feeding their Young, than what is commonly practiſed by the human Species. Among thoſe Creatures, the Dam takes Care that her Young do not want what is neceſſary, and that they do not ſicken, pine away, or die, for want of Food; but then ſhe wiſely governs their Appetites, feeds them by little at a time, and takes Care that their firſt Meſs may be digeſted and paſs'd off the Stomach, before ſhe brings them a freſh Supply. This is very remarkable in Birds, while the contrary Method of feeding them would ſoon kill them: And even in ſuch Creatures as give Suck, the Dam either providently keeps down her Milk by Abſtinence, where it is neceſſary, or elſe is careful to beat off the Young, and not ſuffer them to take too much at once, where they would be in danger of overcharging their Stomachs.

THIS is the Care and Providence of the inferior animal Creation, with regard to their Young; in which, for the Preſervation of their Species, they are much better inſtructed by *Inſtinct*, than we are by *Reaſon*. But this Word *Inſtinct*, is perhaps only another Name for Reaſon of a ſuperior Kind; I mean the Wiſdom of God himſelf, impreſs'd upon the mechanical Frame and Organiſm of the Creatures. And therefore, as *Solomon* ſent his *Sluggard* to the *Ant* for Inſtruction, ſo Mankind in general need not diſdain to learn Wiſdom from the inferior Ranks of Creatures, where they will find animal Nature in its primitive Simplicity, and not at all perverted or corrupted by the Abuſe of Reaſon. For my own Part, when I would ſtudy the Powers, Offices, and Functions of animal Nature, I never conſider them in Men, where there is ſcarce any thing right, but in the Brute Beaſts, where there is nothing of this Kind wrong. And therefore, as a Phyſician, I cannot herein agree with ſome of our right orthodox Divines, who think that the Brute Creatures, as well as Man, ſinned and fell in *Adam*.

BUT to proceed, 'tis certain from Experience, that forc'd Feeding, and an over-quick Growth, is highly pernicious to all young Creatures; and therefore, 'tis never practiſed upon Beaſts or Fowl, but when they are intended for the Pot or the Spit: And then, if they were not taken to Meat, they could not live long, and would be good for nothing elſe. And yet we ſee that Nurſes in general are exceeding fond of putting Children out of their Hands, hugely roll'd and larded with Fat; which might recommend their Keeping, had they fed them only as Turkies or Poultry, and for the ſame Purpoſe. But in theſe fatted Babes, they have only made Work for the Doctor, and laid the Foundation of many

Diſeaſes, which are not ſo eaſily cured, as they might have been prevented.

NOTHING certainly can be more fatal to Children than a Plethora, or an Accumulation of the Fluids, beyond the natural Strength and Proportion of the Solids.

I HERE conſider both the adipoſe Fleſh and the Fat of the Inwards as a Fluid; for ſuch it really is before its Concretion, and upon many Occaſions it liquifies again, and runs into a thick putrid Water, or foul, greaſy, and acrimonious Lymph; thereby inducing either an incurable Dropſy, or inveterate Struma, attended with the worſt Symptoms of an internal Scurvy. But if it ſhould happen in this Caſe, as it ſometimes does, that the Surcharge of Humours finds a Vent, and runs off either by ſome of the natural Evacuations, or by Ulcers and Abſceſſes, brought on by ſtrumatoſe and ſcrophulous Swellings, the Body is frequently ſo much emaciated, as to be reduced to a perfect Skeleton, and the Patient dies in a Phthiſis, Maraſmus, or Atrophy.

AND thus Nature once oppreſs'd and overcharged, runs out of one Extreme into the quite contrary. But where this Plethora does not kill of itſelf, or induce a conſequent mortal Moraſmus, yet the Humours, which have been thus accumulated, before they can be diſcharged, and thrown off again, very often contract ſuch a Foulneſs and Acrimony, as to leave a laſting Weakneſs, and ſcorbutick Taint upon the Solids, and which being thus fix'd upon the Organiſm of the Body, will become hereditary.

AGAINST this over indulgent and too officious Care of the Nurſe, in keeping the Child's Stomach for ever fill'd and clogg'd with Milk, or other Aliments, Nature very often relieves itſelf, by vomiting up, or diſgorging the ſuperfluous Load. In which Caſe, I have ſeen ſome Children, otherwiſe ſound and healthy enough, who would ſuck and vomit, vomit and ſuck again by Turns, all Day long. But though this may ſometimes prevent worſe Conſequences, and keep things pretty well for the preſent, yet the Remedy itſelf here is moſt certainly a Diſeaſe, and is often found ſo in good Earneſt. For the Stomach having been for a long time thus loaded and over-ſtrain'd, is at laſt ſo far weaken'd and relax'd, that it cannot retain a ſufficient Quantity of the Aliment, to ſupply the neceſſary Diſcharges, or to make good the Nouriſhment, and keep up the Strength and Texture of the Solids. By this means, I have ſeen Children almoſt quite exhauſted, or waſted to the very Bone, that when view'd naked, have been perfectly frightful to look at: And yet even this great Depletion and Conſumption of Fleſh, provided there had not been a preceding Plethora, is not dangerous or mortal, if Care be taken in any time. For the Vomiting being once ſtopt, things afterwards ſucceed very well, and the Fleſh is ſoon reſtored, if the Nurſe does not bring on the ſame Diſorder again, by the ſame unnatural Method of Feeding, and overcharging the Stomach.

FROM what we ſo often obſerve in the Caſes of Children, after the Birth, one may form a very probable Judgment of what muſt frequently happen before, during the time of Geſtation. For notwithſtanding the exceeding quick Growth and Acceſſion of Fluids to the Child *in utero*, as already conſider'd, yet this Acceſſion and Growth may as well be forced or urged beyond the Bounds of Nature, before the Birth as after it. Nor can there be any Reaſon to doubt but this is often the Caſe, and that it is one of the moſt common Cauſes of Abortion, in which the forc'd Fruit growing and ripening too faſt, corrupts before it is come to Perfection, and drops off immature.

Now it is certain, that when a Woman while ſhe is Breeding, or during the time of Geſtation, is affected with a Plethora, from any Cauſe whatever, the Child muſt neceſſarily undergo the ſame; in which Caſe the Acceſſion and Growth being precipitated, or preternaturally urged, the tender Creature muſt be in great Danger of an untimely End, or of never coming to Perfection. Now any ſuch Plethora, whether of the Blood-Veſſels or the Lymphaticks, may be eaſily known by its Symptoms; and having before taken notice of what I thought to be moſt neceſſary, in order to prevent or remove any ſuch Diſorder, I need not farther inſiſt upon it here.

'Tis much eaſier to prevent a foreſeen Evil, than to remove it when preſent. A Plethora, or Redundancy of the Fluids, as we have ſeen, is moſt fatal to Infants and Children, whoſe ſoft and tender Fibres cannot bear much Stretching, or any violent and preternatural Diſtention. The Buſineſs of ſoftening ſuppling Diſtention and Relaxation, had been perform'd, *in utero*, ſo far as was neceſſary to open all the Cells of Nutrition, and prepare the Body for its future Growth, Firmneſs, and Solidity. But after the Birth, the Health and Life of the

Child muſt depend upon obtaining theſe three Intentions.

1. To maintain the ſeveral Secretions in their natural and regular Quantities and reſpective Proportions.

2: To take Care that the Supplies do not exceed the Diſcharges, any more than is neceſſary to the natural moderate Growth and Nouriſhment of the Solids. And,

3. To keep up and maintain the Strength, Tenſion, or elaſtick Force of the Solids, and motive Fibrillæ; and to reſtore this elaſtick Tone and Tenſion, as ſoon as poſſible, where it has been loſt or weakened.

The Second of theſe Intentions muſt be left, in great meaſure, to the Nurſes, or to the Diſcretion of thoſe whoſe Buſineſs it is to direct the Food and Nouriſhment of the Child. But the firſt and laſt have a neceſſary Connexion with, and mutual Dependance upon each other.

Now here I know of nothing in the World that is ſo well adapted to the Caſes of Children in general, or that can have a more certain neceſſary or mechanical Effect than *cold Bathing*.

The Reaſons for this Method are ſo very plain and obvious, from what has been ſaid, that I ſhould think it reproaching the Reader's Underſtanding, to inſiſt upon it farther: Nor can I conceive of any Objections to be made to it, but what muſt proceed either from an injudicious Indulgence, or popular Prejudice.

'Tis thought very cruel at leaſt, if not dangerous, to commit the tender Bodies of young weak Infants to the cold Water. This looks like a ſort of Murder, an inhuman Suffocation, and an immediate Extinction of Nature; and thus a thoughtleſs Indulgence pleads againſt all the Reaſon and Experience in the World. But the Uſefulneſs of this Method, is confirm'd and eſtabliſh'd upon the general Practice of whole Nations, as well in the coldeſt as hotteſt Climates; *Experience* having taught the vaſt Advantages of it, not only to the black Inhabitants of *Negro-land*, but even to the frozen *Poles*, *Ruſſians*, and *Laplanders*: Nor have we any Account of Travels ſo far *Northward*, but the Natives have uſed this Method with their Children from the very firſt, and found it the beſt Defence againſt the extreme Rigours of the Air in thoſe cold Regions.

BESIDES, they who make this Objection ought to conſider, that Nature itſelf has interpoſed and determined the Point againſt them, by providing ſomething equivalent to cold Bathing, as its very firſt Operation upon every Child that comes into the World. The different Degrees of Heat and Cold between the Blood and the common Air, is certainly much greater, and more conſiderable, than between the ſame common Air and Cold Water. And yet a Child, as every one knows, cannot be born without coming immediately out of the one, into the other; and this is ſo far from being any way prejudicial, that 'tis abſolutely neceſſary to Life, and the Creature muſt otherwiſe inevitably periſh. And thus it is a very cruel and dangerous thing to be born, and to be brought out of a hot Bath into a Cold; but yet, as this is the Work of Nature, ſome perhaps may imagine it to be very beneficial, and that Immerſion in a Fluid, ſeveral Degrees colder than what the Creature had been ever uſed to before, may now, conſidering the preſent Circumſtances, be attended with the beſt Conſequences in the World. But 'tis very difficult to overcome popular Prejudices, and to give People a Reaſon for what they are reſolved never to believe.

But they who cannot be reconciled to cold Bathing, one would think might be perſuaded to give their Children the natural Benefits and Advantages of the free open Air, which is now become their proper Element, and the true genuine Spirit of Life. The natural Action and Benefit of the Air, is certainly the Birth-right of every living Creature, yet Children are often deny'd even this Liberty, any farther than it is abſolutely neceſſary to Breathing; which is allow'd them as a Matter of *Grace*. For as ſoon as they are born, they are moſt officiouſly clouted, and ſwaddled up in thick warm Coverings, and put into a cloſe hot Bed, with an Admiſſion of but juſt Air enough to breathe in. And under this wiſe Management, the principal Intention of Nature is eluded at firſt, and the tender Creature made uncapable of bearing the common Air, by being deny'd the proper Uſe of it: For the Child has not been thus wrapt and ſtov'd up for many Days, before it has got a great Cold, ſnuffles, pants, and can hardly breathe. And then it is neceſſary to heighten a little the hot Regimen, to expoſe the poor helpleſs Infant to ſtill farther Danger; whereas could the abuſed Patient but ſpeak, and reaſon, he muſt cry aloud againſt this Violence offer'd to Nature.

IT is true, indeed, that Nature and Reaſon, as well as Cuſtom and Decency, require ſome ſort of Cloathing; and we are not intended to go quite naked, like the Beaſts. Such Creatures as are not deſign'd for an artificial Cloathing, and are yet to live in the open Air, have accordingly a natural Proviſion made for them, agreeable to their Circumſtances; not only by a much thicker Skin, but by a warm Covering ſpread over it, of Hair, Wool, or Feathers. But what I aim at here is, that with regard to Cloathing, the colder ſort of Regimen is upon all Accounts to be prefer'd, as being attended with the feweſt Inconveniencies, and leaſt Danger.

WE ſee that the labouring and poorer ſort of People in the Country, go but very thinly clad, ſome of them having ſcarce Cloaths enough to cover them; and yet they are ſtrong, hale, and healthy; able to endure the hardeſt Labours, and the greateſt Extremes of Heat and Cold. Their Food is coarſe, and their Liquors for the moſt part low; but their Stomachs and Appetites are perfectly good, and they exerciſe all the Faculties and Functions of the animal Life, in their utmoſt Vigour, and with the higheſt Pleaſure.

But in Towns and Cities, among the People of Faſhion and Fortune, we find the Caſe quite otherwiſe. They cloath exceeding warm, and lodge upon Feather-Beds even in the Heat of Summer; they are for ever heating the Blood with the higheſt and richeſt Diet and Liquors; they can drink no *Water*, and ſhiver with Horror at the Thoughts of committing their warm tender Bodies to the *cold and cruel Element*. In the Winter they double their Cloathing, and cannot live without large Fires, warm Liquors, and cloſe Confinement within Doors; 'tis terrible even ſo much as to look at the Weather, and a Journey in Froſt and Snow is Death itſelf. By this hot Regimen, the Solids being ſoftened, weakened, and relaxed, the Fluids are accumulated, the natural Evacuations leſſened, and all the Symptoms of Depreſſion, Obſtruction, flatulent Indigeſtion, and Fermentation are brought on. Theſe are the natural Conſequences of the hot Regimen, while Men live as if they were in continual Danger of being frozen to Death; and this is the juſt Reward of ſuch Indolence, Inaction, and Dread of Cold: And 'tis certain, that no People in the World are ſo liable to Colds, and to the worſt Effects of them, as they who live under ſuch bodily Fear of taking Cold, and are continually warming themſelves to prevent it. And thus have I ſeen a tender Creature, in the Heat of Summer, wrapt up in Silks and Flannels, cloſely confin'd in a warm Room, by a good Fire, and juſt keeping Life and Soul together with warm Juleps, and Cordial Drams; and yet, at the ſame time, ſinking, ſhivering, and dying, either with Cold, or from the Fear of taking it.

FROM this Tenderneſs, which ſo much prevails among us, eſpecially in the Fair Sex, we are likely in good time to have a Generation of People, that will never be able to live over a Winter, if they are not froſted before they are born.

WHEN a Child comes firſt into the World, all the ſolid Parts of the Body may ſeem to have been equally warmed, ſoftened, and relaxed; and therefore equally capable of reſiſting the Impreſſions of the Air, and of bearing the ſeveral Changes and Viciſſitudes of Heat and Cold. But yet this is not in Fact the Caſe. For a Child *in utero*, or during the Time of Geſtation, always takes the Temperature of the Mother, as to the different Degrees of Heat and Cold, Softneſs or Firmneſs, Relaxation or Conſtriction, either with Regard to the whole Body in general, or its particular and reſpective Parts.

AND thus we ſee that the Hands and Face of a Child, when but juſt born, have acquired a proportional Strength and Firmneſs to bear the Air without Covering; but the other Parts will be ſoft, tender, and relax'd, and be leſs capable of bearing the Air, in Proportion to the warm Regimen of the Mother, in the Time of Breeding. And therefore, where a Child has been thus debauch'd in the Womb, and by a too hot Regimen forc'd into a relax'd and flatulent Conſtitution, a warmer Regimen will be requiſite at firſt, than could be otherwiſe neceſſary or fit. But then this heating Regimen, with Regard to the Child, is not to be long continued or indulged, and may eaſily be ſlackened and abated by Degrees, with a little Caution and Diſcretion. But the Continuance of this hot Regimen, can only ſerve to ſtrengthen and confirm the tender, relax'd, and flatulent Habit; which muſt ſoon fill the Body with ſuch a Redundancy of hot, ſharp, and windy Humours, as will not be eaſily got off again by all the Power of Medicine, where this external Method is diſregarded.

JUST dipping the Child every Morning in cold Water, and preſently taking it out again, will ſoon bring the Solids to ſuch a Degree of Strength and Firmneſs, as to bear the Air with a very moderate Covering, or thin Cloathing. And hereby the Strength and Elaſticity of the Solids being increaſed, the Secretions, for the moſt Part, will go on in a natural Way; and then a few eaſy Remedies, where Internals are neceſſary, will be ſufficient to keep up, and carry on the ſeveral Offices and Functions of animal Nature.

By the common Method of clouting and ſwaddling up young Children, the extreme Parts of the Body are kept hotter, and have leſs Benefit from the Air than the Stomach and Inteſtines, through which Nature admits a full and free Paſſage of the common Air or Atmoſphere; which is the great Spring and Principle of animal Life.

We ſee what ill Symptoms, and miſchievous Conſequences preſently follow upon it, when this continual Draught or Drain of Air through the whole Tract of the Stomach and Inteſtines, is once excluded, and interrupted by Obſtructions, or the Viſcidity of the Humours, lodged in thoſe firſt Paſſages. And ſome Viciſſitude, or Change of Air, admitted to the external Skin, is of equal Neceſſity, to keep up that Perſpiration of the Body, by the cutaneous Glands or Pores; which is a Secretion of the greateſt Conſequence in the animal Oeconomy:

And therefore, Nature and Reaſon require, that Children in their firſt Coverings ſhould be left open below, and that their Bodies be not at all compreſs'd or ſtraitened by Swaddling, cloſe Garments, or by any other Method.

Whether our common Nurſes will approve of this, I know not, nor am I at all concern'd about it: But ſure I am, that 'tis natural, reaſonable, and neceſſary, to the right Management of Children; and the Advantages of it are ſo obvious and apparent, that nothing but ill Cuſtom and Prejudice can prevail againſt it.

Next to the natural Benefit of the Air, as already conſidered, and which is certainly the Birth-right of every living Creature, Diet in Children is principally to be regarded. As Breaſt-Milk for ſome time, at firſt, is a Proviſion made for them by Nature, it muſt certainly be the beſt and moſt eligible Nouriſhment, till ſuch time as their Conſtitutions come to require a different ſort of Food. But then, as ſome Children are extremely injured, by taking them off from the Breaſts before they are fitted for other Food; ſo others are perhaps as much hurt, by continuing them at it too long.

NOW here the whole Buſineſs depends upon the State and Conſtitution of the Stomach. Where the Stomach is weak, and the Appetite low, or not at all craving, there is the more need of Breaſt-Milk, as the moſt proper Nouriſhment; becauſe ſuch weak Children will take in a ſufficient Quantity of Milk from the Nurſe, when they cannot be made to thrive or grow, upon any other Nouriſhment; their Stomachs having not yet acquired Strength and Firmneſs enough to carry off and digeſt any thing ſtronger, or that being of a cloſe Compage and Texture, requires more Concoction. But on the other Hand, Children, whoſe Stomachs are of a pretty firm Conſtitution and Texture, and whoſe Appetites are conſequently ſtrong and craving, cannot be long allow'd their Fill of Milk, without being fluſh'd up with Fat, Fleſh, and a preternatural Redundancy of the Fluids. And, as I have obſerv'd before, nothing can be more dangerous or fatal to Children, than an over-quick Growth, or an Increaſe of their Fleſh and Humours, beyond the Strength and Proportion of the Solids.

IN this Caſe, a Diet more opening, and more abounding with Solids ought to be choſen. And in ſhort, the great Thing to be obſerv'd in the Diet and Feeding of

Children, is to keep up the natural Proportion of the Solids and Fluids, and thereby to prevent either a plethorick Habit on the one Hand, or a conſumptive Waſte on the other. And 'tis here worth obſerving again, that an Atrophy generally comes on upon a preceding Plethora, that had happened either before the Birth or after it. And from hence it comes about, that under the common Management, Children are ſeldom hurt by under Feeding, but are very often choak'd, ſuffocated, and borne down with a dead Weight of Fleſh, Fat, and ſuperfluous Fluids, beyond the natural Strength and Proportion of the Solids. In which Caſe, the Body is duly prepared, either for a bloated putrify'd Carcaſs, or an exhauſted Skeleton; which are the natural and too common Effects of all ſuch forc'd precipitated Growth, and fluſh'd Feeding. The Dieting and Feeding of Children, according to the Rules and Meaſures which Nature has preſcribed, is therefore a Matter of infinite Conſequence, and not to be ſo much neglected, or ſlightly conſidered, as ſome may imagine. They are not capable of governing and regulating themſelves in this Caſe, and thereforeſtand in the more need of theConduct and Direction of others; and yet the Nurſes are commonly no better Judges of the Matter than the Children themſelves, or at leaſt, are very apt to humour and indulge them in what will be certainly hurtful, and of very ill Conſequence.

As ſoon as a Child is taken off from the Breaſt, either in Whole or in Parts, his Feeding ought to be as ſolid as can well be contriv'd of the Vegetable ſort; ſuch as Oatmeal, Wheat-Meal, Bread, Bisket, *&c.* but firſt of all prepared by boiling and ſoaking, ſo as to ſeparate their Parts, render them of eaſy Digeſtion, and diſpoſe them to paſs off the quicker and cleaner from the Stomach.

UNDER this Management, the thicker their Food is, that is, the more Solids abound in it, the better; becauſe the leſs will ſerve in Quantity, the longer Intervals may be given between the Meals, and the more will the Solids of the Body be increaſed in Proportion to the Fluids; which is the great and principal Intention that ought to be aim'd at in the Feeding and whole Management of Children, as all the Strength and Vigour of animal Nature depends upon it.

WITH Regard to Potables, Childrens common Drink ſhould be Water, or Small Beer, and nothing higher, unleſs it be on ſome very particular Occaſions; in which they may be allow'd now and then ſomething ſtronger, but rather Medicinally, and by way of Cordial, than otherwiſe. But to uſe them to ſpirituous Liquors in common, is to deſtroy their Conſtitutions, to debauch and ruin them, and to lay a Foundation for innumerable Diſeaſes and Ills in Life, from which perhaps they can never afterwards be freed. And this I take to be one great Reaſon, among others, why People of plentiful Fortunes, or ſuch as are in eaſy affluent Circumſtances, are ſo ſeldom bleſs'd with ſound, ſtrong, and healthy Children. They are deſtroy'd by Indulgence, and periſh by the Arts of unnatural Cookery.

BUT beſides the natural Advantages of the Air, ariſing from a moderately thin, light, and looſe Cloathing, and the neceſſary Regulations of Diet, both which I have briefly conſider'd; it may be obſerv'd farther, that Children from the very Beginning ought to be allow'd as much Motion or Exerciſe in the free open Air, as their State and Circumſtances will admit. Air is their proper Element, and the Uſe of it is not merely to breathe in. They ought not therefore, only for the ſake of ſparing the Nurſe, or to ſave a little Labour, to be kept almoſt conſtantly ſtov'd up in Bed, or rock'd into Silence in a Cradle, under cloſe Coverings; unleſs it be now and then, when it is juſt neceſſary to take them up for Dreſſing or Feeding. If People would but put themſelves into their Circumſtance, they would not be willing to be ſerv'd ſo, as if they had been brought into the World to be taken no notice of, or did not want Air and Exerciſe as well as other Folks.

IT is true, indeed, that Children at firſt require more Sleep than ordinary; and this muſt be allow'd them. But they are often kept ſtew'd up, when they would be glad of more Liberty, and when ſuch a Compliance with Nature would conduce very much to their Health and Strength, if they could obtain it.

WHEN a Child once comes to be able to run about, he will not be beholden to others for Air and Exerciſe; but ſerve himſelf in that Way, if he be not reſtrain'd from it, againſt Nature and Reaſon. And 'tis therefore but a natural Piece of Juſtice to help them in this Reſpect, till ſuch time as they come to be able to help themſelves.

MUCH more wretched than it is, would be the Fate of Children, did not their own natural Vivacity and Activity, when they come to be ſet adrift, in great meaſure correct thoſe Errors which had been impreſs'd upon the Conſtitution in their Breeding and firſt Infancy. But being now turn'd looſe into the open Air, they run down their Fat, throw off the redundant Fluids, recover the natural Secretions, and acquire ſuch a Strength, Firmneſs, and Elaſticity of the Solids, as very often retrieves the injured Conſtitution, even in ſpite of all that fatal Tenderneſs and Indulgence, which had been ſo ſtrongly arm'd and directed againſt them. But Children in this Stage of Life, will do their own Work, and recover themſelves, if they are not farther injured and corrupted by unreaſonable Reſtraints. The Benefit and Pleaſure they hereby find in following the Dictates of Nature, are ſo vaſtly great, that nothing can prevent them, if they are not too rigidly and viciouſly confin'd to the Rules and Principles of an in-door civiliz'd Debauchery.

THESE Advantages of Exerciſe in the free open Air, are ſuch, as Children cannot have in *London*, ſo well as in the Country; and I take the Bills of *Mortality* in *London*, to be a ſtrong and ſufficient Confirmation of the Truth of what I have been here advancing, concerning the Advantages and Neceſſity of Air and Exerciſe to Children: And whoever will make the Obſervation any where elſe, will find it hold good univerſally, that Children die in a greater or leſs Proportion, as they are more or leſs allow'd the natural Benefits and Advantages of Air and Exerciſe.

THERE are no Children in the World ſo ſtrong and healthy, as in ſuch Parts of the Country, where the Women have moſt Air and Exerciſe, and are expoſed to all Wind and Weathers, till the very Time of their Delivery. And 'tis a vain thing for Women of Faſhion and Fortune to imagine, that they can anſwer this End, by any Aſſiſtance of Phyſicians, while they are reſolv'd not to help themſelves.

IT is not, indeed, here to be ſuppos'd, that People of Fortune are to be put to Labour, or ſet upon the common Drudgeries of thoſe who are of a lower Rank and Situation in Life. But then, where Air and Exerciſe are not the Effects of Neceſſity, they may be made a Matter of Choice and Diverſion; which is all that I aim at. And this is a Neceſſity, which no Body can be exempted from, unleſs they will want *Health* and *Eaſe*, and give up all the Comfort of their own Lives, and the Happineſs of their Children and Families: which is, I think, the greateſt and moſt calamitous Poverty of all.

UPON a juſt Balance, and generally ſpeaking, the Neceſſities and Diſtreſſes of the

Rich, are certainly greater than thoſe of the Poor; and it muſt be allow'd as a much leſs Evil, to want Money, than to want Health, where Money or any thing elſe can give no real Enjoyment: And 'tis great Pity, that a good Eſtate, or plentiful Fortune, ſhould lay the Foundation of Miſery to our ſelves and Off-ſpring, which is certainly a great Bleſſing in itſelf, and capable of being made ſo.

ATHLETICK and manly Exerciſes were look'd upon as the Glory of the *Grecian* and *Roman* Youth, while thoſe two famous and celebrated States were in their Height of Proſperity and Grandeur.

A MODERN modiſh fine Gentleman was a thing ſcarce known among them, or a Creature that muſt have been regarded with an univerſal Contempt. They were not then taught to Dreſſing, Dance, and Game, or to debauch the Ladies, by making them more weak and effeminate than they are by Nature. But it was the great Buſineſs of their Academies and publick Schools, to train them up to Labour and Hardſhips, to inſpire them with a Contempt of Death and Danger, with a maſculine nervous Virtue, and with an heroick Love of their Country: But, *O Tempora, O Mores!* There is nothing which Children are more naturally and ſtrongly addicted to, than Imitation; and by this Means, from the Force of Example, our young People of both Sexes are commonly taught to ſpend an Eſtate or Fortune before they have got it, and to ruin a good Conſtitution, when they have only a bad one to deſtroy.

BUT no Method, either of Prevention or Cure can be of any Uſe to thoſe who take more Pleaſure in loſing than enjoying their Health. 'Tis a Story commonly told, of a Gentleman who reſolv'd to reſign Eye-ſight, when his Phyſician aſſur'd him that this muſt be the neceſſary Conſequence of his Drinking. He choſe, no doubt, what he thought the greater Good, which was *Blindneſs*, for the Pleaſure of debauching his *Senſes*.

AND this in Effect is the Choice which fond Mothers, and indulgent Nurſes commonly make for Children, who cannot judge for themſelves: They will humour them in every thing they can ask or cry for, with regard to thoſe corrupt diſtemper'd Appetites, which they themſelves have created; but will not ſuffer them to follow the Dictates of wiſe and ſober Nature. And when by a hot, ſpicy, oleaginous, ſaccharine, and ſpirituous Diet, they have heated and accumulated the Fluids, obſtructed the Secretions, and weaken'd and relax'd all the Springs of Motion, 'tis neceſſary to keep them on in the ſame Way, becauſe they are weak and ſickly, till they are reliev'd by the *laſt Enemy*; but in this Caſe, their *beſt Friend*.

THESE indulgent Guardians of Infancy, are therefore very often in Conſequence the worſt Enemies to Mankind, and by an ill-grounded unnatural Kindneſs, bring on all thoſe Miſchiefs which they ſo much dreaded: And when the tender Parent or Nurſe has thus deſtroy'd her own Fondling, by acting contrary to all the Laws and Principles of *Nature* and *Reaſon*, ſhe has nothing but *Religion* left to comfort her, by reſolving all the Errors and Blunders of ſuch a fatal Indulgence, into the *Will of God*. But tho' it might be hard to bring in ſuch exceſſively kind and well-meaning Creatures as guilty of *Murder*, yet, I think, ſo many and great are the Means of better Information in this Caſe, that *Chance-Medley* would be too favourable a Judgment upon it: For, after all the Softenings that the thing may be capable of, it muſt be highly criminal to indulge Children in their corrupt diſtemper'd Appetites and Deſires; and at the ſame time deny them the Gratification of the truly natural and regular ones. This looks like raiſing a *Devil*, and then feeding him with our own Blood: 'Tis introducing the Practice of human Sacrifices, and offering up the Fruit of our Bodies, and all the natural Appetites, to that grand devouring Idol LUXURY.

O HUNGER, Hunger, immortal Hunger! Thou art the Bleſſing of the Poor, the Regale of *Temperance*, and the delicious Guſt of every *plain Morſel*; but curſed is the Man that has turn'd thee out of Doors, and at whoſe Table thou art a Stranger! yea, thrice curſed is he who ſhall always thirſt, but hunger no more! But I muſt not indulge this haranguing, leſt it ſhould be call'd preaching. And if any one ſhould think that I have been here too warm, let them conſider that my Heart was in it, and that I have never writ any thing in my Life with more ſincere and ardent Wiſhes, for the Good of Mankind.

I KNOW the Goddeſs *Luxury* will pronounce me an Atheiſt for what I have ſaid, and exclude me from the Commonwealth of *Good Livers*, as an Enemy to the right Uſe of Money; but I am ſufficiently arm'd againſt any ſuch Perſecution.

I HAVE now conſidered the fundamental Cauſes and Principles of thoſe Weakneſſes and Errors of Conſtitution, which commonly prevail among us; and which, as the natural Seeds of our Grievances and Complaints, we often derive from our firſt Infancy, or even Conception in the Womb. And this I have done, that the Origin of this Evil being underſtood, Men may take care to prevent it as much as poſſible, by cutting off the firſt Occaſions of it. I ſhall endeavour all along to ſet Nature in a proper Point of View, to ſhew what are her own genuine Operations, and what the neceſſary Conſequences muſt be, when ſhe comes to be turn'd off her Biaſs, and put out of Courſe. And this being done, every one muſt be left at Liberty, whether they will act for or againſt Nature, and whether they will prefer Truth or Falſhood, where their Health and Lives are concerned.

NOTWITHSTANDING what I have hitherto obſerv'd, concerning the original Cauſes and Occaſions of Childrens Diſorders, and the Means of preventing them; this Diſcourſe might be thought very imperfect, ſhould I here put an End to it. And therefore I ſhall now proceed to the curative Intentions under the ſeveral Diſeaſes, to which theſe tender Creatures are moſt generally liable. When the Evil is preſent, it is too late to prevent it; and therefore, the moſt proper Methods ought to be taken to remove the Complaint, and cure the Diſeaſe.

AND here, that I may be the more diſtinct and methodical, I ſhall diſpoſe what I have farther to offer, under certain general Heads or Topicks; which will contain the principal Diſeaſes incident to Infancy and Childhood, or at leaſt, ſuch of them, to which all the reſt may be eaſily reduced.

§. I. FLATULENT Diſtentions of the Stomach and Bowels, with wind and ſharp viſcid Humours lodg'd in the firſt Paſſages, is one of the greateſt and moſt common Diſorders incident to Children in their Infancy. And this flatulent Cholick is the more neceſſary to be conſider'd, and timely apply'd to; becauſe when neglected or ſuffer'd to run on, it often terminates in ſpaſmodick Coughs, Vomitings, Diarrhœa's, Ruptures, Convulſions, a Mortification of the Bowels, and Death itſelf.

THERE is not perhaps a more common Cauſe of this Flatulency in Children, and all its fatal Conſequences, than neglecting the neceſſary natural Purgation, or cleanſing off the Meconium, as they call it, after the Birth. This is the firſt and great Care of provident Nature, where ſhe is not prevented, or ſome way or other put beſides her Intention in it: And becauſe this is a

Matter ſeldom ſo regarded as it might, I ſhall be a little the more diſtinct and particular upon it.

HERE then it may be obſerv'd, that in Infants or Children firſt born, the Inteſtines are fill'd and ſtuff'd with a flatulent, viſcid, and acrimonious Matter, of a dark or blackiſh green Colour, generally call'd the *Meconium*, which had been collected, and not diſcharged *in utero*; eſpecially towards the latter Period of the Geſtation. The cleanſing or purging off this viſcid and acrid Excrement, ought to be the firſt Care after the Birth, it being as neceſſary an Evacuation to the Child, as the Lochia to the Mother, and cannot be neglected without imminent Danger.

IN order to this neceſſary Purgation, Nature has provided a moſt benign and congenial Cathartick in the firſt Milk, which ſome call the Beechings; but 'tis no Matter what it is call'd, as long as we are agreed about the thing itſelf.

THIS Milk conſiſts of a thin inſipid Serum or Water, pretty richly ſtock'd with an Oil or Cream, that is ſomewhat ſtimulating, as being join'd with an animal cathartick Salt. Theſe I take to be the true natural Principles of it, as having often

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examin'd it with the utmoſt Nicety; and I am very well ſatisfy'd, both from the Analyſis, and the Effects of it, that I am not miſtaken. 'Tis beyond all Diſpute, that Nature has deſign'd this as the firſt Pabulum after the Birth, for all viviparous Creatures, or ſuch as are nouriſh'd by Milk; and conſequently that no Creatures are depriv'd of the natural Benefit of it, but ſuch as are call'd *rational*; and that among Rationals, the Privilege of being deny'd this firſt Benefit of Nature, is confin'd to the polite, genteel, and improv'd Part of the Species.

BUT it may be proper here, firſt of all, to deſcribe the natural Effects of this purgative Milk, and then leave People to judge how well they acquit themſelves in depriving their Children of it; and how far they can juſtify the Opinions of thoſe who adviſe them to it, or the Skill of ſuch as do not adviſe them to the contrary.

WHERE this firſt Milk is given, the oily and ſaline Parts, by their Lubrication and Stimulus, are carried down the whole Tract of the Stomach and Inteſtines, and purge or cleanſe off together with it, the viſcid acrimonious Excrement, already ſpoken of. And in the mean while, the thinner and more limpid Parts of this Liquor, depurated of its Oils and Salts, is carried through the

Lacteals and defluent Lymphaticks, to all the Parts of the Body, which derive their Supplies from the Stomach. By this Means, not only the firſt Paſſages are purged of their groſſer Excrements, and innumerable conſequent Diſorders thereby prevented; but at the ſame time the Lacteals and Lymphaticks in the remoter Parts of the Body, are waſh'd and cleans'd from their Viſcidities and Foulneſſes, contracted during the Geſtation. Now this End being anſwer'd, by a wonderful Oeconomy of Nature, the Milk preſently changes its Conſiſtence and Properties, and becomes a moſt fit and congenial Nouriſhment to the Body thus prepared for it. 'Tis impoſſible to contrive any artificial Method, to anſwer this Intention with equal Advantages. I take it as a certain Maxim, which can never be too much regarded, that *Nature does nothing in vain:* From whence it neceſſarily follows, that perverting the Courſe of Nature muſt be always dangerous, and that the Pretence of being wiſe, above what is written in Nature, is the moſt conſummate Folly. I ſpeak this merely as a Phyſician, and as not excluding Mankind from the Benefits of ſupernatural Revelation; which I doubt they can have no Pretence to, who would be thought to put Nature into a better Method and Courſe of Action, than God himſelf has done.

THIS ſucking the Beechings or firſt Milk, as it is naturally deſign'd for all young Creatures that are nouriſh'd from the Breaſt, ſo it is of great Advantage here, to the Mother, as well as to the Child; as it frees the one from a Liquor, that from its own Nature is exceeding apt to coagulate and form viſcid Concretions in the glandular Caverns of the Breaſts, and ſupplies the other with the only natural Cathartick and Cleanſer that can be proper for this Time: Nor can this firſt Milk be as well drawn by a Nurſe as by the Child, as the former is more painful and difficult, as well as more imperfect; and is ſuch a Relief as cannot often be obtain'd till it is too late, and the Miſchief begun.

AND ſuch is the Conſequence of things here, that as the Breaſts are often tainted, and made uncapable of producing a good nutritive Milk for the whole Time afterwards, ſo the Child is expoſed to flatulent Gripes, Ruptures, and Convulſions, by the Retention of a ſharp viſcid Excrement, that ought to have been purged off at firſt, by the Means which Nature had provided. This, as I imagine, is in ſhort the State of the Caſe; and they who may ſtill think otherwiſe, would do well to publiſh their Reaſons for it.

But where this firſt and moſt natural Method has not been obſerv'd, the Aſſiſtance of Art will be often neceſſary; and *hic labor, hoc opus eſt*. For a ſmall Quantity of the original ſharp, viſcid, and corroſive Matter, as afore-mentioned, being left upon the Stomach and Inteſtines, and not purged off in time by the natural Method, very often brings on all thoſe diſmal Conſequences above recounted; and then it may require the utmoſt Attention of the moſt skilful and diligent Phyſician, to ſave the tender Creature. For though purging is here indicated by Nature, to get rid of thoſe Dregs and Recrements, *ab utero*, which had not been ſufficiently cleanſed off at firſt, yet this muſt be ſet about with great Caution and Circumſpection, and Care muſt be taken not to irritate the Stomach and Bowels farther, which are too much ſtimulated before, with the Heat, Flatus, and Acrimony of the detain'd Matter. And yet, at the ſame time, ſomething or other muſt be done to carry it off.

I shall here ſet down the Method which I take to be moſt rational, and which I have found moſt ſucceſsful in Practice. I ſhall not pretend to ſhew my Reading, by heaping up an infinite Number of inconſiſtent and contradictory Authorities, but ſhall only make ſuch Obſervations as I know to be well grounded, both upon Experience and the Nature of the thing.

I HAVE already taken notice of the common, grand, or fundamental Error, in denying new-born Infants the Beechings, or firſt purgative Milk; and we have ſeen, that where Children are precluded the Benefit of this natural Cathartick, at a time when ſuch a Purgation was moſt neceſſary, the Conſequences are always bad, and ſometimes fatal: Yet where Nature has been thus defeated in her firſt Intention, the Aſſiſtance of Art ought to be call'd in, and the ſooner the better; for every Day's Delay in ſuch a Caſe, muſt be dangerous, and the Neglect is not always retrievable.

BUT before any bad Symptoms appear, or while the Flatus and Gripes are not yet become grievous, a direct Purgative ought to be given. To which Purpoſe, I think, nothing can be better than Cream of Tartar, Rhubarb, and Salt of Wormwood, in equal Parts, ground together into a Powder, and made up into half Scruples. This may be given three or four Mornings ſucceſſively, in a Spoonful of Water and Sugar, or Water-Gruel ſweetened. It will be beſt to continue this till the firſt uterine Dregs and Recrements are purged off, which may be known by the Stools returning to their natural Colour and Conſiſtence.

THESE Powders agree perfectly well with Children, and may be given at any time; but may ſometimes need to be ſtrengthened a little, either by increaſing the Doſe, or by ſubſtituting Calomel and Jalop-Root in the room of the Rhubarb, and Cream of Tartar; and this eſpecially, where the Child is five or ſix Months old, and the Matter to be diſlodged is very adheſive, viſcous, and acrimonious. In ſuch a Caſe, the latter Compoſition is much more ſafe and effectual, than any weaker or ſlower Cathartick, which may only raiſe a Fermentation and Commotion in the Stomach and Bowels, without deterging and carrying off the noxious Matter.

UPON this Account, the Uſe of Manna, how much ſoever it may commonly prevail, is certainly ill grounded. I have frequently known it occaſion the moſt painful Gripes, and flatulent Diſtentions of the Viſcera, without ever attenuating and throwing off the viſcous obſtructing Excrements. And I preſume, that any Body elſe, who has much attended to this Practice, muſt have often obſerv'd the ſame thing.

§. 2. WHAT has been laid down under the foregoing Section, ſuppoſes, that no very bad Symptoms from the Gripes and Flatus have yet appear'd; I mean, no threatening Indications of great Pain, Diſtention, Heat, or Eroſion of the Stomach and Bowels. But where theſe Symptoms are once found, no Purgative ought to be given at all, till the Pain has been firſt taken off, and the nervous Syſtem quieted. And this is an Obſervation of ſuch Conſequence, that all true Practice muſt depend upon it, not only with regard to Children, but all other Patients, of what Age or Conſtitution ſoever.

THERE is not, perhaps, a more miſchievous Practice than this, of attempting to force a Paſſage, as they call it, by Emeticks, Catharticks, and ſtrong purging Glyſters, in the Paroxyſm of a flatulent Cholick. One would think, that they who ſet about this Work, muſt needs be Madmen or Fools; ſince increaſing the Stimulus by ſuch a Method as this, while the Veſſels are ſo much over-ſtretch'd, and painfully diſtended before, muſt neceſſarily endanger a Rupture, and Mortification of the Bowels; and this I fear is too often the Conſequence of it: And then, when the Miſchief is brought on, and the Matter paſt Retrieve, the judicious Operator cries out, that the Caſe was deſperate, and that it was impoſſible to force the Way.

But I wonder who taught theſe wiſe Men ſuch Methods of forcing Nature, and whether they have deriv'd their Skill from the Antients or the Moderns. This is doubtleſs a ſignal Inſtance of the great Succeſs of Experience in Phyſick, without Theory, and of the mighty Advantages of being a good practical Phyſician, by a blind Submiſſion to Authority, againſt all common Senſe, Judgment, or Diſcretion.

A strong flatulent Tenſion of the Stomach and Bowels, attended with exceſſive Pain, is, beyond all Diſpute, a very threatening Caſe; and ſuch as requires ſome preſent Relief, without ſtimulating and forcing Nature to an Operation, which ſhe is then abſolutely uncapable of. And when a pretended Doctor, under ſuch a Circumſtance, ſhall approach with his Emeticks and Catharticks, whether they are ſtrong or weak, gentle or ſavage, and whatever Experience he may vouch for himſelf, he ought certainly to be ſent off without his Fee; and to be told, that Death is coming on faſt enough without his Help.

BUT under ſuch a Circumſtance, there is no time to be loſt in Conſultation, nor can there be any need of it. The only rational and effectual thing to be preſently done, or, as ſoon as poſſible, is to take off the Pain, and pacify the Outrage of the Nerves, by giving ſome warm alexipharmick Opiate, in ſuch a Quantity as is neceſſary; that is, ſufficient to anſwer the Intention. He who knowing the natural Effect of a Medicine, and yet gives it up with the Life of his Patient, before he has raiſed his Force high enough for the Urgency of the Symptom, is fitter for a Fidler than a Phyſician.

HIPPOCRATES, though he has ſaid more towards the making a Man a good Phyſician, who has any Genius for it, than all the practical Writers in the World beſides; yet he never pretended to write Recipe's, to fix Doſes, or to confine Nature within certain Boundaries, which ſhe is never to tranſgreſs; as if Men might be taught to practiſe Phyſick in the ſame way that they learn to ſing or dance. But to return to the Caſe in hand; When the Pain is once taken off, the enraged Nerves quieted and compos'd, and thereby the Æquilibrium of the Fluids reſtored; it will be no difficult Matter to remove the Obſtructions, which may then be done by any of the common and well known Methods of Evacuation; whereas attempting it before, is declaring War upon Nature, and driving her out of her only Refuge and Hope. But I need not enlarge upon this. I have ſaid enough to thoſe that will take it; and they who will not, muſt be left to the Succeſs and Conviction of a contrary Method.

§. 3. When a Child has eſcaped the Dangers of his firſt Infancy, which are commonly owing to a viſcid, hot, and acrid Ferment in the firſt Paſſages; he has another critical Operation of Nature to undergo, and that is the *Breeding of Teeth.* At this Time a Fever often ariſes, of the true inflammatory or effluent Kind, with great Heat, high Pulſe, Difficulty of Breathing; a Phrenzy or Delirium, purple Spots, and petechial Irruptions, Convulſions, Mortification, *&c.* And in this Caſe, ſuch Children are moſt ſeverely treated by the Fever, who are of a corpulent, plethorick Habit, and have been uſed to a too hot Regimen. But where the Conſtitution is good, the firſt Paſſages clean and open, and the Blood has not been over-heated, the Danger is not great, but the Teeth are commonly bred and cut without much Trouble. But when the Fever riſes high, and Matters are like to come to Extremity, the curative Intentions are thoſe which follow:

1. To cool and qualify the Efferveſcence of the Blood, with proper Diluters. 2. To moderate and keep off the Violence of the Pain with convenient Opiates, as the Caſe requires. 3. To keep the firſt Paſſages clean and open, by Gliſters, Purgatives, or an opening Diet. 4. To prevent any conſiderable Part of the heated, fermented, and putrify'd Serum, from falling upon the Brain, Lungs, Diaphragm, or Intercoſtals, by a timely and ſeaſonable Application of Epiſpaſticks or Veſicatories. And laſtly, to facilitate the Riſing and Cutting of the Teeth; by ſoftening, cooling, and relaxing the Gums, with proper Oils or Mucilages. Theſe are the principal Intentions, and the Means of obtaining them; to which I ſhall add a few general Remarks, and then conclude the preſent Article.

THE firſt Intention of qualifying and ſuppreſſing the preternatural Heat, Rarefaction, and Efflatus of the Blood, is much better anſwer'd by proper diluting Liquors, and a cooling, opening Diet, than by any thing elſe. And how much ſoever the Teſtacea, calcin'd Hartſhorn, Chalk, and the abſorbent Boles or Earths, may be cry'd up in this Caſe, and brought into common Uſe, yet I can by no Means approve of them: For theſe things are in a manner in-

indigeſtible, and apt to lodge upon the Stomach and firſt Paſſages, in hard, compact, and indiſſoluble Concretions. And by this Means the Appetite is often loſt, the Stomach weaken'd and clogg'd, and the natural Heat and Efflatus of the Blood ſunk and impair'd beyond Recovery: Eſpecially when this happens to Children, who cannot bear any Streſs of Vomiting, or any ſuch Force upon the firſt Paſſages, as may be neceſſary to cleanſe and clear off thoſe Concretions and Lodgments of ſuch indiſſoluble and indigeſtible Matter.

THOUGH Purgatives, in this Caſe, may be ſometimes neceſſary, yet they are not to be often repeated, or too much depended on; becauſe they are apt to weaken and relax the Stomach and Inteſtines, check Perſpiration, and fix the ſcorbutick Salts and Oils of the Blood upon the Viſcera.

GLYSTERS are much more convenient, and better adapted to the Caſes of Children, where cooling or qualifying the inordinate Heat and Rarefaction of the Blood is aim'd at: But in this we often find a Difficulty; becauſe ſuch a Method, however uſeful, is frequently impracticable: For where the Bowels are fill'd and ſtuff'd with Wind, the Air contain'd in the Inteſtines ruſhes down, upon introducing the Pipe, and fills the Bladder, ſo that the Liquor cannot be forced up. And this oftener happens to Children than in grown Perſons, becauſe they naturally reſiſt, and have not the Diſcretion to aſſiſt and facilitate the Operation: And therefore, in ſuch a Caſe, a Purgative muſt be given, and even repeated, if Neceſſity urges, though it may be attended with ſome Inconveniencies, which the other Method of Glyſtering would be free from.

WHERE the flatulent Diſtentions and Gripes are ſevere, eſpecially if Spaſms, Convulſions, or the like Symptoms appear, Bliſtering is preſently neceſſary without any Loſs of Time. In ſuch Caſes, to try any other Methods, and neglect this, is but trifling, and hazarding the Life of the Patient to no Purpoſe.

EMOLLIENT relaxing Oils and Mucilages to the Gums, are of great Uſe to facilitate the Riſing and Cutting of the Teeth. To this Purpoſe of cooling, relaxing, and opening the Gums, Diacodium is a very good thing; but more eſpecially a pretty ſtrong Decoction of Marſh-Mallows and Poppy-Heads, in thick Milk, Cream, or Neats-foot Oil; which wonderfully takes off the Heat, and aſſwages the Pain of the inflam'd and tumify'd Parts.

VERY often, when a Tooth is come to the Edge, or upper Surface of the Gum, the Skin, by reaſon of its Strength and Thickneſs, retains it, and hinders its Cutting. In this Caſe the Skin ought to be cut or ſeparated with a Lance, to make way for the Tooth ; and hereby a very great Inflammation, and the worſt Symptoms of the Fever may be ſometimes prevented.

§. 4. ANOTHER very common, and ſometimes fatal Diſeaſe in Children, is that which they call the *Rickets*. In this Diſeaſe the Abdomen, in the firſt Place, ſwells and grows hard, and ſoon after the Bones of the Head or Cranium are tumify'd, enlarged, and become thicker and ſofter than ordinary, with unequal fleſhy Protuberances, eſpecially about the Suturus. At the ſame time, the other Bones in general, chiefly about their Joint or Inoſculation, follow the ſame Fate, and are affected in like Manner. As the Bones, in this Caſe, ſeem to ſuck in Water like a Sponge, while they are enlarged and tumify'd, they become ſo ſoft and flexible, that they are eaſily incurvated, and take any wrong Poſition, juſt as the Weight and Dependency of the Parts incline them. This preternatural Diſpoſition of the Bones, affecting principally the Vertebræ, Coſtæ, and Sternum ; theſe Bones once tumify'd, incurv'd, curv'd, and weaken'd, become at length uncapable of ſuſtaining the Action of the Diaphragm and intercoſtal Muſcles; from whence the Thorax being more and more ſtreighten'd, and the Reſpiration impeded, the Patient at laſt dies under an Aſthma, Phthiſis, or Dropſy; and ſometimes with a Complication of all three.

FROM the Inquiries and Obſervation of twenty Years paſt, I am very well ſatisfy'd, that this Diſeaſe begins in the Meſentery, which may be look'd upon as its original Seat and Forms. This is evident, not only from the firſt Symptom of the Diſeaſe diſcovering itſelf by the Tumour and Tenſion of the Belly, but from all the Diſſections and Examinations made upon ſuch Subjects, by Surgeons and Anatomiſts. In which Caſe, the lymphatick Glands, and adipoſe Cells of the Meſentery, are always found ſtuff'd, tumify'd, and diſtended, with an oily, viſcid, and concreted Lymph. And 'tis plain, that the nutritious Lymph or Chyle receiving its acrid Taint, or concreſcible Quality here, and being from hence communicated to the other Parts, by the Membrana adipoſa, muſt produce the whole Train of Symptoms which conſtitute the Diſeaſe, as already deſcrib'd.

FROM all this one may fairly conclude, that the Diſeaſe now under Conſideration, conſiſts in the Redundancy and unequal Diſtribution of a viſcid, acrid, and conſcreſcible or indurated Lymph: And from what Cauſes and Occaſions this may come about, is ſo evident from what has been already obſerv'd, that it cannot be far the inſiſted upon here.

THIS Diſeaſe moſt commonly ſeizes upon Children under two Years old; and tho' it may ſometimes come later, yet it is then leſs dangerous, more eaſily cured, and ſeldom ariſes to any great Degree. But there is another Diſeaſe very near akin to this, and more obſtinate, which often invades Children about the time that the Rickets leaves them, or a few Years after; and that is a Struma, Scrophula, or King's Evil. This generally comes on after a little farther Advance in Age, upon ſuch as have had the Rickets before, and have been ill treated under it, or but imperfectly cured. Though indeed, a Struma or Scrophula is ſometimes hereditary, and may make its Appearance at any time. But theſe two Diſeaſes are ſo nearly ally'd, and depend ſo much upon the ſame Cauſes, that I have thought it beſt to conſider and treat of them both together, becauſe they will ſerve mutually to illuſtrate each other, both with regard to the morbid Conſtitution itſelf, and the Method of Cure.

IN ſcrophulous, as well as rickety Patients, upon Examination, the Glands and adipoſe Cells of the Meſentery are found to be fill'd, diſtended, and tumify'd, with a viſcid, concreted, or indurated Lymph; and it cannot be reaſonably doubted, but the Lymph being here corrupted and tainted with this acrid, concreſcible Quality, is from hence communicated to the other Parts, by the Membrana adipoſa, as already obſerv'd. But it may be proper here to aſſign the Reaſon why the ſame Cauſe has not altogether the ſame Effects, upon very young Children, or under three Years old, as it has afterwards, upon Perſons of a little more advanced Age, as ſuppoſe at five or ſix Years old, and upward. And this I take to be intirely owing to the different State and Conſtitution of the Bones in young Children; and in ſuch as being more grown, the Solids are ripen'd into a greater Degree of Strength, Firmneſs, and Compactneſs.

THE Bones are at firſt ſo extremely tender, ſoft, and pliable, that with a ſmall Addition of a redundant Fluid, they are eaſily tumify'd, diſtended, and weaken'd, ſo as to be made uncapable of ſuſtaining the Action of the Muſcles; and from hence muſt follow the common and well known Symptoms of the Rickets, as already deſcrib'd. But when the ſame Bones, by farther Age and Growth, have acquired a greater Strength, Firmneſs, and Solidity, they cannot be ſo eaſily impreſs'd by the Action of the Fluids, or will not ſo readily imbibe and retain them. And therefore, in this Caſe the redundant Lymph being reſiſted by the more denſe, ſolid, and compact Bones, is thrown outward upon the Tendons and glandular Fleſh; where it gradually hardens, indurates, and forms ſcrophulous Tumours. And theſe Tumours, during the Courſe of the Diſeaſe, are continually fed and ſupply'd with a ſaline, conſcreſcible Lymph, from the lymphatick Glands, and adipoſe Cells of the Viſcera, eſpecially the Meſentery.

As the Rickets commonly ſeizes Children about the time of their breeding Teeth, and is the Conſequence of the Tooth-Fever; ſo a Struma very often follows the Rickets, when it has not been timely regarded, or but imperfectly cured. And theſe Diſeaſes are the more dangerous and difficult to cure, when they come upon a very fat or plethorick Habit, when they have been brought on by a too groſs Feeding, a hot Regimen, or long Confinement in a cloſe, thick Air, and Want of neceſſary Motion.

NOT only the Meſentery where it firſt begins, but any of the other Viſcera, may be affected with a ſcrophulous Tumour and Induration. And thus we ſometimes find the ſame morbid Affection communicated to the Pancreas, Liver, Spleen, and Kidnies. When this happens, the Struma, beſides its own proper Diagnoſticks, will be attended with other Symptoms, peculiar to the Parts affected; ſuch as a ſymptomatical Aſthma, Jaundice, Dropſy, Gonorrhea, Fluor Albus, *&c.* In this Caſe the Phyſician ought not to promiſe much, ſince he will find, that after his utmoſt Diligence and Skill, the Cure will be very difficult.

THOUGH a Struma generally affects the Glands, either internal or external, and moſt frequently thoſe about the Neck and Throat, yet it ſometimes fixes upon the Joints, Tendons, and even upon the Bones themſelves. When this viſcous gelatinous Mucilage happens to be thrown in too great a Quantity upon the Bones, by intercepting the Propagation and Diſtribution of the nutritious Lymph, it induces a Caries, Rottenneſs, or Mortification of the Bone where it fixes. And this is another very bad Symptom of a Struma, under which the Phyſician ought to call in the Aſſiſtance of a skilful Surgeon. But the Subject I am now upon is of ſuch infinite Conſequence to Mankind, eſpecially with regard to Children and young People, that it may be fit here to ſearch it to the very Bottom, and conſider this morbid Habit a little diſtinctly, with reſpect to its Cauſes, Concomitants, and Cure. And this is the more neceſſary, becauſe I do not know that the Matter has been ever yet treated with any tolerable Juſtneſs or Perſpicuity: Nay, he who ſhall read what has been hitherto offer'd upon it by practical Writers, will find it ſerve rather to perplex and miſlead him, than to form his Judgment, or direct his Practice about it.

'Tis certain in Fact, that the animal Oil, or mucilaginous Lymph, ſecreted in the ſeveral Glands of the celluloſe Membrane, is extremely gelatinous and concreſcible; and that when it comes to be lodged upon any particular Part, where it ſuffers a Diminution of its Heat and Motion, it preſently indurates, inſpiſſates, or hardens, like the Juice of Liquorice, Poppies, and other oleaginous Plants. This animal Oil, or concreſcible, gelatinous Lymph, is the Matter which affords Nouriſhment, Growth, and Solidity to all the Parts of the Body univerſally.

'TIS a moſt unconteſted Principle in Philoſophy, that Nature always works by the neareſt and moſt direct Means, or obtains her Intention with the feweſt and moſt ſimple or uncompounded Cauſes. The different Effects which are the true and genuine Productions of Nature, are not owing to ſo many different Cauſes, but to the ſame very few ſimple and uniform Cauſes; which produce different Effects, according to the different State and Circumſtances, Texture and Conſtitution of the paſſive Recipient, or Subject to be wrought upon.

AND this is the Caſe here; the animal Oil, or gelatinous concreſcible Lymph, before-mentioned, being every where the ſame, and not of as many different Sorts or Kinds as there are Glands, almoſt infinite in Number, to ſecrete it by; but a conſtant Supply of this animal Oil, or concreſcible Lymph in very large Quantities, being requiſite, to ſerve the Purpoſes of animal Motion, Nutrition, and Growth; it was therefore neceſſary, that theſe lymphatick Glands ſhould be interſperſed, in vaſt Numbers, all over the Body, according to all the Diviſions and Subdiviſions of the Muſcles, and adipoſe Membrane.

This gelatinous concreſcible Oil, or nutritious Lymph, while it circulates in its proper Veſſels, and retains a conſiderable Degree of Heat and Motion, continues fluid; but when it is depoſited in any of the nutritious Cells of the membranous and vaſcular Parts of the Body, and there comes to be fix'd, it gradually inſpiſſates, hardens, and conſtitutes the Subſtance of the Solids. Nutrition therefore is nothing elſe but the Dilutation and Repletion of an Infinity of exceedingly minute Cells, interwoven of the infinitely minute Fibrillæ or Threads, of which all the Coats and Veſſels of the Body conſiſt.

As animal and vegetable Nutrition, Growth, and Solidity, conſiſt in the Repletion of theſe minute Veſicles or Cells, with ſuch a concreſcible Oil, or gelatinous indurating Lymph, as above deſcrib'd; ſo this Mechaniſm is moſt conſpicuous and remarkable in the Membrana adipoſa, in which the nutritious Veſicles or Cells being larger, and capable of a greater Diſtention, it has been call'd by way of Diſtinction, the Membrana celluloſa. Not but all the other Coats, Veſſels, and Membranes are likewiſe cellulous, and nouriſh'd after the ſame manner; but in theſe the nutritious Veſicles or Cells being much ſmaller, more elaſtick, and never intended for ſo great a Diſtention, they are ſcarce perceptible without a Microſcope; and then they may be eaſily diſcover'd in the other Coats and Veſſels, in the Leaves of Trees and Plants; and indeed, in almoſt every other vegetable or animal Subſtance, under proper Circumſtances, and where the Obſervation can be conveniently made. And as the Increaſe or Growth of the Solids, is owing to this concreſcible Oil, inſpiſſated and hardened in their nutritious Veſicles or Cells, ſo this indurated nutritious Oil, by Heat and Motion, in Boiling, Diſtillation, or other proper Managements, may in great meaſure be obtain'd from theſe Solids again, and reduc'd to its former State of Fluidity.

BUT ſince this ſame gelatinous concreſcible Oil, ſupplies not only the Fat of the Inwards, and the adipoſe and muſcular Fleſh all over the Body, but likewiſe the ſolid Subſtance of the Nerves, Cartilages, and Bones; it may be here inquired, how it comes about that the ſeveral Parts of the Body differ ſo much, with regard to their Hardneſs, Compactneſs, and Solidity, if the nutritious Matter itſelf be not different? To which I reply, that this concreſcible Fluid will be more or leſs concreted, indurated, and hardened, according to the different Circumſtances it is under, and the different original Texture and Conſtitution of the Parts that are nouriſh'd by it.

Of all the Parts of an animal Body, there is the leaſt Degree of Heat and Motion in the Subſtance of the Bones, as theſe contain the greateſt Share of original Solids or fibrous Parts, in Proportion to the Fluids. And therefore the nutritious concreſcible Oil is more ſtrongly and firmly indurated and condenſed in the Subſtance of the Bones, than any where elſe. Whereas, on the other hand, the nutritious Cells or Veſicles of the adipoſe Membrane being very large, and its membranous or fibrous Parts exceedingly thin and ſlender, and the Heat and Motion at the ſame time being here greater: From theſe Cauſes, the animal concreſcible Oil is not ſo much indurated in the Production of Fat, but may eaſily, with a little increaſed Heat and Motion, be reſolv'd into a Fluid again. And the like, by allowing for theſe different Circumſtances, may be concluded of other Concretions and Nutritions of the ſame Kind.

Having occaſionally mentioned the lymphatick Glands, which we find every where interſperſed and diſſeminated throughout all the Diviſions and Subdiviſions of the Muſcles and adipoſe Membrane, it will be neceſſary to my preſent Purpoſe, to take that Matter into a little farther Conſideration, and briefly to explain the Nature and Uſe of thoſe Glands. In order to which, I ſhall lay down the three following Lemmata; which for their Certainty and Clearneſs, I ſhall take leave to aſſume as Poſtulata, to avoid the needleſs Trouble of proving things that are too evident to be deny'd.

1. THE Blood, the nutritious Oil, and the Subſtance of the animal Body, are ſpecifically heavier then common Water, or than any thing that we make Uſe of as Food or Nouriſhment, excepting Fleſh it ſelf, or animal Subſtances.

2. THE Matter excreted or thrown off by the natural Evacuations taken at a Medium, is not ſpecifically heavier than common Water.

3. NO Glands, Strainers, or ſecretory Tubes whatever, can ſeparate or drain off the thicker, denſer, or groſſer Parts of any Liquor, while the thinner and more fluid Parts are retain'd and left behind.

AS for thoſe who may deny either of theſe Propoſitions, I deſpair of ever convincing them of any thing, and therefore ſhall not attempt it; but taking theſe Principles as commonly known and granted, ſhall proceed to make ſuch a Uſe of them, as may be moſt conducible to the preſent Purpoſe.

Now from hence it muſt be a neceſſary Conſequence, that the Uſe and Deſign of the above-mentioned Glands, cannot be to ſeparate or ſtrain off the nutritious animal Oil, from the thinner and more fluid Maſs; but on the contrary, to draw off the thinner and more fluid Parts of the Lymph or Chyle from this ponderous, adheſive, and concreſcible Oil, in order to preſerve and keep the Oil for the Buſineſs of Nutrition and Concretion, as already explain'd. And from hence it muſt likewiſe follow, that this Oil cannot, by any Glands or Secretories, be drawn off from the Blood, as being more viſcid, adheſive, and gelatinous; that is, leſs fluid than the Blood itſelf: and conſequently, any other Part of the Blood, even the Craſſament itſelf, while mix'd with the Serum, might ſooner paſs the Glands, than a thick concreted Oil of ſuch a Nature.

I know not how the Patrons of the *Bellinian* Hypotheſis of animal Secretion, will ſet aſide theſe plain Facts, and ſuch neceſſary Conſequences from them; but if they think they are able to do it, I hope they will not be ſo much wanting to themſelves,

ſelves, as not to attempt it. But this I think is certain, that there are few Diſeaſes incident to human Nature, which that Hypotheſis muſt not give a wrong Account of, and miſlead Men in the Cure.

I HAVE ſaid thus much concerning the genuine Proceſs of Nature, in the Buſineſs of Nutrition, that I might the better explain the morbid Conſtitution, now under Conſideration, which proceeds from a vitiated or diſtemper'd Nutrition, or from what they call an Error in the laſt Concoction.

IT is plain, from what has been here ſaid, that the animal gelatinous Oil ought not to concrete and harden, but in the nutritious Cells of the Coats and Veſſels, where it is conſolidated, and paſſes into the Subſtance of the Body. But when this nutritious Oil is redundant, or accumulated in a Quantity and Proportion beyond what is neceſſary to the Nouriſhment of the Parts, and ſupplying their natural Waſtes and Decays; the Perſon thus affected muſt either grow immoderately fat, or elſe this redundant ſuperfluous Oil being thrown upon the relax'd diſtended Glands and Viſcera, muſt there concrete, indurate, and form ſchirrous, ſcrophulous, and wenny Tumours; which by deriving to themſelves the proper Nouriſhment to the other Parts, quite invert and overthrow the Oeconomy of Nature.

No Sort of Subſtance abounds ſo much with this ponderous, gelatinous, and concreſcible Oil, as Fleſh, which conſiſts of little elſe; and of all Drinks in common Uſe among us, Ale, or a ſtrong Malt Liquor, eſpecially whilſt new, yields the greateſt Plenty of it. And this diſeaſed Habit is eſpecially ſtrengthened and confirm'd by a ſedentary recluſe Life, or indulged Eaſe and Indolence, where there is not Motion or Exerciſe ſufficient to promote an æquable Diſtribution of the nutritious Lymph, and to carry on the natural Evacuations, in their neceſſary and due Quantities.

I HAVE hitherto deſcribed a ſimple Struma, or this ſcrophulous Conſtitution, conſider'd in itſelf, and without any farther Complication. In this Caſe, the Diſeaſe conſiſts in a Dilatation, Obſtruction, and Tumefaction of the Glands, by a glutinous indurated Lymph, without any ſenſible remarkable Heat, Acrimony, or Pain; or any conſequent Tendency to Fermentation, Putrefaction, and Eroſion: But it frequently happens, that a Struma or Scrophula is complicated and join'd with a Scurvy; which gives it much worſe Qualities, and endangers a Canceration of the tumify'd Glands, or at leaſt induces foul Ulcers, and a ſharp eroding Gleet, from the Parts affected; which renders the Cure much more tedious and difficult.

IT may be obſerv'd here, that as long as the Urines paſs off well, and diſcharge, as they ought, the ſtrong fermentative Salts and Sulphurs of the animal Fluids, there can be no Danger of a Scurvy, nor is there ever any ſuch thing: But when theſe, from ſome Fault or Defect in the Kidnies, are obſtructed, kept back, and thrown upon the Parts, they produce a Scurvy, which will be attended with various and different Appearances and Symptoms, according to the Degree or Strength of the Diſeaſe, and the different Parts affected. In which Caſes, the only rational, or indeed, poſſible Method of Cure, is to rectify the urinary Evacuation, by reducing it to its natural State and Circumſtances.

BUT having diſcourſed ſo largely of this, in the *Philoſophical Principles of Medicine*, there can be no need of inſiſting farther upon it here. And the Effects of ſuch a ſtrong, ſulphureous, and highly fermentative Salt, as that of the Urine, when it comes to mix with the animal nutritious Lymph, and to form together with it, preternatural Concretions, and Tumours in the Glands, are ſo very obvious, and ſo eaſily deducible, from what has been already ſaid, that there can be no great Occaſion here to ſpend much more time about it.

WHEN the ſoft, nutritious, and mucilaginous Oil or Lymph, happens to concrete in the Glands, it forms a pale or white Swelling, much of the ſame Colour with the natural Skin; in which Caſe, the Gland affected may be more or leſs tumify'd and indurated, but without any Pain, Heat, or Inflammation. And ſuch ſcrophulous Tumours may be diſſolv'd and diſcharged with all the Eaſe and Safety in the World. But when the Tumour is attended with an inflammatory Heat, and a ſharp pungent Pain, and follow'd with ſuch Symptoms as threaten a virulent Ulcer coming on, one may pronounce it ſcorbutick, as well as ſcrophulous; in which Caſe, if it be not very mildly and judiciouſly treated, there will be great Danger of a Canceration.

A CANCER is certainly the higheſt Degree of a ſcorbutick Malignity, in which the hot ſulphureous Salts, before-mentioned, mixing and fermenting with the nutritious gelatinous Lymph, produce a corroſive cauſtick Liquor, not much inferior to the Oil of Vitriol. And ſuch an Ulceration is ſo exquiſitely painful in itſelf, and deſperate in its Conſequences, that the leaſt Diſpoſition towards it, ought to be carefully attended to, and guarded againſt.

AND thus have I given as clear an Idea as I could, in few Words, of thoſe glandular Diſeaſes, the Seeds of which are commonly laid in Childhood, though ſome of them may not break out till a riper Age. The purſuing one thing after another, in their natural Order and Production, has led me a little beyond my intended Boundaries; and, perhaps, induced me to ſay ſome things that I had advanced before, and more largely inſiſted on elſewhere. But for this, I hope, the Reader will eaſily excuſe me, ſince I have offered nothing by way of Theory, but what I thought abſolutely neceſſary to a right Notion of the Diſeaſes themſelves, as being evidently connected with the Symptoms, which I have already deſcribed; and with the Method of Cure, which I am next to propoſe.

I SHALL begin with the Rickets, of which Diſeaſe I have already ſaid enough to give an Idea of it, and to ſhew in what State and internal Conſtitution of the Solids and Fluids it conſiſts.

As there is a viſible Plethora and Redundancy of the Fluids, in this Diſeaſe, inſomuch that the very Bones are ſoftened, drench'd, and ſwoln with Water, like a Sponge, 'tis certain that Evacuations are neceſſary; and yet the tender Conſtitutions of Children, eſpecially when weakened under this Diſeaſe, cannot bear any Evacuation but what is very mild and gentle: Moderate Purging therefore muſt be admitted, and no Body ever attempts the Cure of the Rickets without it.

Rhubarb and Calomel in equal Parts, to the Quantity of about ℈*ſ*. or more, as the Caſe requires, is perhaps, the beſt accommodated to this Diſorder, of any other Purgative. After this has been repeated three or four times, allowing a clear Day or two between, it will be ſeldom needful to continue the Uſe of it any longer.

After this, it will be ſufficient, with regard to the Intention of opening and cleanſing the Inteſtines and Viſcera, to give the Æthiops twice a Day, throughout the whole Proceſs of the Cure: And I may venture to ſay, that this Medicine is ſo well adapted in general, to moſt of the Diſeaſes to which Children are liable, that perhaps, it cannot be mended either by Nature or

Art. But this I think is worth obſerving, that an Æthiops made of two Parts Mercury, and one of Sulphur, and where the common Stone-ſulphur is uſed inſtead of the Flowers, is much better than the other in common Uſe, as any one that ſhall try it will ſoon be convinced.

To this muſt be join'd Cold-Bathing, without which I do not think a compleat and perfect Cure can be made; and this alone may better be depended on for the whole Cure, than all the Methods in the World without it. The Reaſon of this is ſo evident, from the Nature of the thing itſelf, and Truth in Fact, ſo well grounded upon Experience, that it would be needleſs to inlarge farther about it.

The Weakneſs and Laxity of the Solids in Children, render them more than any others liable to Obſtructions, Indurations, and Tumours of the Glands and cellular Membranes; or to all the Species, Symptoms, and Appearances of an effluent and influent Scurvy.

I here comprehend under the general Name of the *Scurvy*, all thoſe Diſeaſes which ariſe from a hot, ſharp, concreſcible Oil, or mucilaginous indurating Lymph, lodg'd in the Ventricles of the Glands, and membranous Cells of the ſeveral Coats, Veſſels, and Teguments of the Body: For though there is almoſt an infinite Variety in ſeveral particular Symptoms and Appearances of theſe Diſorders, yet their general Cauſes and Method of Cure are much the ſame, only allowing for the different Strength of the Conſtitution, the different Degrees of Heat, Sharpneſs, and Eroſion, to which the morbid Salts and Sulphurs thus retain'd are raiſed, and the different Turn of the Diſtemper as external of internal, or as varieuſly affecting this or the other Part. A Multitude of Diſtiuctions perplex any Subject, and this is an Error which Men always run into, when by affecting to be ſupercritical and exact they make themſelves very obſcure. And by this means, inſtead of communicating Knowledge, or ſtriking up any new Light, they only raiſe a Duſt about them, and lead the Reader into a Labyrinth, without any Clue to bring him out again.

The Scurvy has been repreſented under ſuch an infinite Variety of Symptoms, with as many different Methods of Cure, that the Word ſeems to ſignify nothing; and yet, perhaps, there is not a general Name in the whole Practice of Phyſick, which might be underſtood in a more certain and determinate Senſe.

THE cutaneous and urinary Diſcharges are the largeſt and moſt conſiderable in the animal Body, to which all the reſt bear but a very ſmall Proportion.

THE excrementitious Salts and Sulphurs, which have been moſt highly raiſed by glandular Digeſtion and Fermentation, and ſeparated from the nutritious Oil or Lymph, were intended by Nature to be thrown off together with the thinner redundant Serum, in Perſpiration, Sweat, and Urines. But where theſe are occaſionally obſtructed and retain'd, they form ſeveral ſorts of Tumours, Indurations, and Eroſions in the Glands and Membranes, which I call *glandular Diſeaſes*, or *ſcorbutick Diſorders*. And they who pleaſe to take the Word under the ſame Acceptation, cannot be at a Loſs about my Meaning.

THE Scurvy, as thus underſtood, may be diſtinguiſh'd into the Hot and Cold, and into the Effluent or External, and the Influent and Internal; which are all the neceſſary and eſſential Diſtinctions in the Caſe that I know of. And tho' theſe Diſtinctions have given very different Names to a great many Diſorders, as affecting different Parts, and diſcovering themſelves under different Symptoms, yet the general Cauſes and

Method of Cure, as I ſaid, are ſtill the ſame.

In all ſuch Diſeaſes, the curative Intentions are theſe two. 1*ſt*, To attenuate and diſſolve the concreted Matter in the Ventricles of the Glands and cellular Membranes. And 2*dly*, To carry off the morbid Matter thus diſſolv'd, and fitter for Evacuation by Perſpiration, Sweat, and Urine. For it may be taken as a general Rule, which I have always found true in Fact, that theſe Diſorders are never well eradicated and clear'd off by Emeticks or Catharticks, and very ſeldom by Salivation.

In the hot eruptive Scurvy, the obſtructed concreted Matter abounds with an alkaline inflammatory Oil or Sulphur, very apt to rarefy and run into a viſcid putrefactive Ferment.

This Species of the Scurvy ariſes from an Obſtruction and Retention of the urinous putrefactive Salts and Sulphurs, which not paſſing off by the Kidnies, are thrown upon the Surface, and there form ſome obſtinate, laſting, cutaneous Diſeaſe; ſuch as the Itch, running Scabs and Blotches, the Elephantiaſis, Lepra, Struma, ſcrophulous Ulcers, *&c.* In this Caſe the Perſpiration is not leſſened, but rather increaſed, by the great Accumulation of the groſs putrid Fæculencies, which ought to paſs off with the Urines. And hereby the cutaneous Glands and Excretories being over-charged and loaded, the excrementitious redundant Matter there concretes, and forms theſe Tumours and hot Eroſions upon the Skin.

IN this Turn of the Scurvy, the firſt thing to be done, is to cleanſe and deterge the cutaneous Glands and Emunctories, and to clear the Skin: But when this is effected, the Work is but juſt begun, and the ſame Foulneſſes will ſoon collect again, till the natural Drain of the excrementitious Salts and Sulphurs of the Urine is brought on and reſtored; and as ſoon as this Intention is obtain'd, the Cure is complete and perfect.

THE cleanſing and deterging the cutaneous Glands and Excretories, is the leaſt though the firſt Part of the Cure, and I have often ſeen this done, and yet in a little time, the ſame Diſorder and Collection of the firſt ſcorbutick Matter have returned again.

THE firſt Intention of diſſolving, attenuating, and carrying off the ſcorbutick Concretions in the cuticular Glands and Emunctories;

ries, may be beſt obtain'd, ſo far as I have ever yet found, by the following Method.

1. HOT and Cold Bathing are of great Efficacy to this Purpoſe. I mean to be uſed together, or immediately ſucceeding one another.

LET the Patient be put into a warm or hot Bath for half an Hour, or forty Minutes, till the Pores are all opened, and the Sweats are moderately raiſed and brought out. And then let him be taken out, and immediately immerſed in cold Water for half a Minute, or juſt time enough to dip the Head two or three times; and then taken out again, and put to Bed, in order to keep up a pretty free flowing Sweat for three or four Hours, to be maintain'd and ſupported with any of the common warm Diluters, ſuch as Sage-Tea, Wine-Whey, Poſſet-Drink, *&c.* At the ſame time, the Parts affected may be ſlightly touch'd every other Night going to Bed with the Unguentum Neapolitanum, or ſomething equivalent; in every Ounce of which, a Drachm of the prepared Cantharides has been mix'd and incorporated, firſt reduced to the moſt ſubtle Powder. And upon this any common ſudorifick Draught or Bolus may be given to be ſupported with Diluters, as before, in order to keep up a moderate breathing Sweat for the Night. This Method will ſoon cleanſe and deterge the cutaneous Glands and Emunctories. But then, as I ſaid, the Cure will be very imperfect, and the Patient's Hopes cannot laſt long; for the ſame Complaints will ſoon return, without reſtoring the natural and uſual Drain and Diſcharge of the urinous Salts and Sulphurs.

AND here comes in the diuretick Method; which I have pretty well conſider'd and explain'd already. However, it may be farther obſerv'd, that a larger Quantity of Urine in theſe Caſes, is but ſeldom neceſſary: Such Patients commonly make Urine enough in Quantity, but without thoſe Fæculencies and Foulneſſes which ought to paſs with it; and which are, in this Caſe, ſo far as I have ever yet obſerv'd, abſolutely neceſſary to the Cure. And therefore, to what I have already offered concerning the Uſe of Diureticks, and the Method of promoting this as well as every other natural Evacuation, by directing crude Mercury or Quickſilver to the Emunctories, together with the other appropriated Medicines, as already known and eſtabliſh'd for promoting ſuch or ſuch Diſcharges; I ſhall only here add, that as to this preſent Intention, the animal Salts and Oils contain'd tain'd in Inſects, ſuch as Millepedes, Earth-Worms, Bees, Cantharides, *&c.* are the moſt effectual. Theſe differ only in the Degree of their Strength, Stimulus, and Volatility; and may therefore, under the foregoing general Management, be directed to any Age or Conſtitution.

BUT all our cold and influent Scurvies commonly ariſe from an Obſtruction of the cutaneous Glands and Excretories, or Diminution of Perſpiration and Sweat. And in this Caſe, the Effects and Symptoms are ſo many and various, and commonly paſs under ſo many different Names in Phyſick, that it would be difficult to deſcribe or aſſign them all. In ſhort, this influent Scurvy ariſing from an Obſtruction and Retention of the perſpirable Salts and Sulphurs, according to the different Parts affected, is a Phthiſis, a Jaundice, a Gonorrhea, a Fluor albus; 'tis the Hyp-Spleen, and Vapours, a windy Flatus, Indigeſtion, Melancholy, and almoſt every thing that has not been well explain'd, and ſeldom cured. And as all Nature has been rack'd and tortur'd to very little Purpoſe, in theſe Caſes, perhaps it might be worth while to try and farther to improve my Method of mercurial Sweats and Diureticks: For tho' I have improv'd this Method for many Years paſt, ſo far as I have been able, yet

I cannot ſay that I have brought it to any ſuch Perfection, but there may be ſtill Room enough left for farther Advances.

I MUST here obſerve farther, that theſe ſcorbutick Taints and Diſorders are ſometimes mix'd and complicated of the two Species of it, already mentioned, when the Fæculences of the cutaneous and renal Emunctories are both retain'd and obſtructed in the Ventricles of the Glands, and the Cavities and Cells of the Membranes. But by conſidering the diſtinct Appearances and Symptoms of theſe two different Cauſes, their ſeveral Complications may be well enough underſtood, and the Method of Cure directed accordingly.

THE Fomes, Seeds and Stamina of theſe Diſorders, are commonly laid in the firſt Stages and Period of Life, when they are moſt eaſily cured, and the farther ill Effects of them prevented. I have therefore choſen to throw in thoſe Conſiderations here, which I thought the proper Place for them. Not that all theſe Diſorders are peculiar to Children, but as they commonly take their Riſe from the firſt Stage of Life, though they may not often appear in their great and ſenſible Effects, till riper Years, A STRUMA, Scrophula, or King's Evil, is one of the moſt obſtinate ſcorbutick Diſeaſes, incident to Children or Youth. And where it is not derived hereditarily from the Parents, the Seeds and Principles of it are commonly depoſited upon the Glands and Membranes very early in Life. The firſt Symptoms and Appearances of this being neglected in Children, often lays the Foundation of innumerable Ills, and the moſt grievous Complaints afterwards; which, however they may be palliated, are ſeldom quite eradicated, or perfectly cur'd. For as this morbid Conſtitution, by Continuances, is ſtill more and more confirm'd, and ſpreads farther through the Habit, it fixes the Taint upon the Solids, by firſt overſtraining, and then eroding and breaking them, and thereby quite deſtroying their Elaſticity, Uſe, and Action, and rendering the Caſe hopeleſs and incurable.

AND this Turn of the Scurvy is the more threatening and difficult, as it is generally complicated, and ariſes from a Retention and Obſtruction both of the cutaneous and renal Foulneſſes, or redundant excrementitious Salts and Sulphurs. And from hence we find, that as Perſons thus affected perſpire but little, and ſweat with Difficulty, ſo the Urines are for the moſt

Part pale, limpid, and without Sediment, though otherwiſe not defective in Quantity.

IT would be very hard to give any general Deſcription of this ſcrophulous Scurvy, ſo as to take in all its Symptoms, Degrees, and gradual Advances. But what has been obſerv'd concerning the Cauſes of the Scurvy in general, and the ſeveral Species of it, may help any one to conceive pretty rightly of this ſcrophulous Sort, in its Formation and Progreſs.

IT commonly begins in the ſimple or conglobate Glands, eſpecially the meſenteriack and ſubcutaneous: And that this muſt be ſo, is evident from the Theory, general Cauſes, and firſt Principles of the Diſtemper. But as theſe Glands, which are firſt affected, are in Length of Time more and more tumify'd and indurated, ſo theſe Tumours, Indurations, and Eroſions are gradually propagated to the more remote and compound Glands; nay, to the Muſcles, Tendons, and even to the Bones themſelves, which are at laſt affected with a Caries, Rottenneſs, and foul Ulcers.

WHILE theſe ſcrophulous tumify'd Glands are external, or near the Surface, and the tumify'd Gland is not faſten'd with any ſtrong Roots or Fibres to the circumjacent Parts, but will eaſily move or ſlip forward or backward, and is without Pain, Inflammation, or Tendency towards Suppuration, it may be eaſily removed by Inciſion, and ſafely taken out by the Surgeon. But where the ſwell'd harden'd Gland or Glands ſtrongly adhere to the Parts about it, or is attended with great Pains, and eſpecially if ſurrounded with any large Nerves or Blood-Veſſels, the chirurgical Operation will be difficult and dangerous, whether it be perform'd with a Knife or a Cauſtick; becauſe any ſuch ſcrophulous Tumour, by Means of the remaining Roots and Fibres ſtill left about it, will be very apt to cancerate, and thereby become much more inveterate and incurable than before.

But there is another Method of removing theſe ſcrophulous Tumours, where a Surgeon can come at them, which I like much better, and have often found ſucceſsful. And that is, by procuring a Suppuration, and diſcharging the obſtructed concreted Matter from an Abſceſs. And to this Purpoſe the Emplaſtrum Mercuriale, in the laſt *London Diſpenſatory*, cannot be ſufficiently admired and recommended.

This Plaiſter is almoſt a fourth Part of it Quickſilver, and is therefore juſtly and wiſely adapted and contriv'd to anſwer the greateſt Intentions of this Kind.

I HAVE ſeen it do Wonders, in ſuppurating, diſcharging, cleanſing, and healing ſcrophulous Tumours of ſeveral Sorts. And this it effects, without any Pain or Inflammation, and conſequently without any Danger of a Canceration: Which I believe cannot be effected by any Cataplaſm, or other external Application.

IN theſe ſcrophulous Caſes, the mineral purging Waters are of very good Uſe, as they cleanſe and deterge the firſt Paſſages, and waſh off the Foulneſſes of the Urines; and at the ſame time, by their Aſtringency, contract and ſtrengthen the overſtretch'd tumify'd Glands, and thereby enable them to throw off their retain'd concreted Matter. But theſe Waters are then moſt effectual to the Purpoſe, when they are join'd and given with ſome of the warmer Detergents, of which, in this Caſe, I take the Gum Guaiacum, and Elixir Proprietatis to be the Chief.

THE Tincture of Cantharides alſo, according to the *London Diſpenſatory*, is uſed in ſuch Caſes with good Effect: And perhaps, in ſuch ſluggiſh phlegmatick Diſorders and Indiſpoſitions of the Viſcera, there is not a better Medicine of the Kind to bring off the Fæces and Recrements of the Urines.

BUT though cleanſing the firſt Paſſages by moderate Catharticks, or even Emeticks in Caſe of need, is neceſſary in this as well as in all other Methods of Cure, where Medicines are at all required; yet I look upon the mercurial Diſſolvents, Deobſtruents, and Detergents, directed to the cutaneous and renal Glands; as has been already conſidered and explain'd, to be the great and principal thing of all.

FINIS.

THE

CONTENTS.

THE Mechanical Practice of Phyſick page 1

PROPOSITION I. Lemma. p. 6

No ſort of Subſtances can paſs the Lacteals, recipient Lymphaticks, or concoctive Strainers, but in the Form of Fluid, previouſly reduced to an exceeding fine and imperceptible Vapour.

Experiment 1 p. 13
Experiment 2 ibid.
Experiment 3 p. 14
Experiment 4 p. 16
Experiment 5 p. 18
Experiment 6 p. 19
Scholium p. 25

PRO-

PROPOSITION II. p. 43

The true, rational, and mechanical Practice of Phyſick, conſiſts in regulating the natural Secretions or Evacuations, by promoting ſuch as are defective, and reſtraining ſuch as are exceſſive and redundant.

Corollary p. 53

PROPOSITION III. p. 55

The Preſſure of Fluids is an active Force, propagated inſtantaneouſly thro' the whole Column or Canal in which the Fluid is continued, and is not generated in time, like the accelerating Force of Gravity in the perpendicular Deſcent of heavy Bodies.

Corollary p. 58

PROPOSITION IV. p. 60

The uniform inſtantaneous Motion, produced by the Preſſure of a Fluid from a given Height, is the ſame which would have been generated in a given time, by the accelerating Force of Gravity, in falling from the ſame Height of the ſuperincumbent Fluid, above the Orifice or Point of Efflux.

Corollary 1 p. 61
Corollary 2 p. 62
Corollary 3 p. 63

PROPOSITION V. p. 64

The Section or Area of the Orifice, with the Height of the Fluid being given, to find the Quantity of Matter diſcharged in a given time.

Scholium p. 66

PROPOSITION VI. p. 78

The Velocity and Moment or Impetus of the Blood, are ſtill decreaſing in its Propagation from the Heart to the Extremities of the Arteries, and increaſe again in the ſame Proportion towards the Heart.

Scholium p. 82

PROPOSITION VII. p. 87

To explain the principal morbid Conſtitutions, and the mechanical Effects of Medicines in general.

PROPOSITION IX. p. 135

The peculiar and ſpecifick Qualities and Properties of acid and alkaline Medicines, are intirely alter'd and deſtroy'd, by the digeſtive Action of the Stomach, before they can be convey'd to and mixed with the Blood.

PROPOSITION X. p. 136

To explain the Nature and Conſequences of Fermentation in general.

PROPOSITION XI. p. 139

To explain the Mechaniſm and Proceſs of Nature in glandular Digeſtion, Secretion, and Nutrition.

PROPOSITION XII. p. 145

In all animal Motion, the original active Force is intrinſically in the Solids, and the Fluids only act as they are acted upon.

Scholium 1 p. 149
Scholium 2 p. 155

PROPOSITION XIII. p. 165

To explain the Nature and Uſe of Sudorificks, or the Method of curing Fevers by Sweating.

Scholium p. 199

PROPOSITION XIV. p. 205

To explain the moſt ſenſible, and obvious, or mechanical Effects of crude Mercury, or Quickſilver.

PROPOSITION XV. p. 219

To conſider and explain the morbid Symptoms and Diſdorders of breeding Women, with their natural Cauſes, Prevention, and Cure.

PROPOSITION XVI. p. 281

To explain the Nature, Origin, and Cure of Childrens Diſeaſes; and of ſuch Diſorders in general, as are derived from our firſt Infancy.